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Fiscal Years 2003 – 2014

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16. Abstract

This report contains the Federal Aviation Administration (FAA) forecasts of aviation activity at FAA facilities for fiscal years 2003-2014. These include airports with FAA and contract control towers, air route traffic control centers, and flight service stations. Detailed forecasts were developed for the major users of the National Aviation System--air carriers, air taxi/commuters, general aviation, and military. The forecasts have been prepared to meet the budget and planning needs of the constituent units of the FAA and to provide information that can be used by State and local authorities, the aviation industry, and the general public.

The outlook for the 12-year forecast period is for a slower recovery in the demand for aviation services and products relative to last year's published forecasts. This is due to sluggish U.S. and global economic growth, the loss of "consumer wealth" resulting from the plunge in equity stock prices, and the deterioration in air carrier yields and profitability caused by the loss of significant numbers of full-fare business travelers. In addition, the possibility of war with Iraq has greatly increased the risk and uncertainty of the forecasts.

Overall, the outlook is for moderate economic growth and inflation and declining real fuel prices. Aviation activity is forecast to increase by 22.0 percent at the combined FAA (266 in 2002) and contract towered airports (217 in 2002, 224 in 2003) and 27.2 percent at air route traffic control centers. U.S. scheduled domestic passenger enplanements are forecast to increase 57.3 percent--large air carriers increasing 51.1 percent and regional/commuters growing by 92.1 percent. Total international passenger traffic between the United States and the rest of the world is projected to increase 72.5 percent. International passenger traffic carried on U.S. flag carriers is forecast to increase 74.4 percent. The general aviation active fleet is forecast to increase by 8.7 percent while general aviation hours flown grow by 19.8 percent.

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PREFACE

I am pleased to submit to the aviation community *FAA Aerospace Forecasts, Fiscal Years 2003-2014*. These forecasts are developed annually by Robert L. Bowles and his staff in the Statistics and Forecast Branch for use by the agency in its planning and decision-making processes. In addition, these forecasts are used extensively throughout the aviation and transportation communities as the industry plans for the future.

This year's report contains 10 chapters which discuss four major areas: (1) the U.S. and world economic environment, assumptions, and predictions used in developing the FAA aviation forecasts; (2) historical data and forecasts of future aviation demand and aircraft activity for three major non-military user groups--large commercial air carriers, regional/commuter airlines, and general aviation/helicopters; (3) workload forecasts for FAA and contracted towers, en route centers, and flight service stations; and (4) the outlook for commercial space transportation. The report concludes with a discussion of our forecast accuracy and year-by-year historical data and forecasts for selected aviation demand and activity series.

These forecasts continue to call for a recovery in the demand for aviation products and services but at a slower pace than presented in last year's publication. This is largely due to the lingering effects that the 2001 economic slowdown and the events of September 11th are having on the U.S. commercial and general aviation industries. The recovery in passenger demand has stalled and with it the industry's chances of returning to profitability in the near-term. A total of six carriers have filed for bankruptcy since September 11th, and nearly one-quarter of industry capacity is now being operated by carriers in Chapter 11 bankruptcy. In addition, growing international tensions and additional bankruptcies have greatly increased the risk and uncertainty of the current forecasts, both in the short-term and long-term.

The near-term forecasts (FY 2003-04) for commercial aviation were developed utilizing a set of assumptions regarding future capacity together with expert judgement as to the strength and timing of the recovery from the events of September 11th. Forecasts for the years 2005 and beyond were based on results derived from econometric models. Forecasts for general aviation continue to rely heavily on analyst judgement and expert opinion.

Briefly, both U.S. and world economic activity is expected to recover strongly beginning in the 2nd half of FY 2003, to grow rapidly through 2005, then expand at more moderate rates over the remainder of the forecast period. Aviation demand is projected to be relatively weak in 2003, then recovery strongly in 2004-05, and resume more stable levels of growth in 2006 and beyond. Demand at FAA air traffic facilities is expected to be flat in 2003, then resume more normal levels of growth over the rest of the forecast period. Commercial aviation demand and activity at FAA facilities are expected to

return to pre-September 11th levels by the 2005-06 time horizon.

In reading and using the information contained in this document, it is important to recognize that forecasting is not an exact science. Forecast accuracy is largely dependent on underlying economic and political assumptions. While there is always some degree of uncertainty in the short-term, the long-run average generally tends to be more stable and accurate. However, the events of September 11th have significantly altered many of these relationships. Whether these changes are permanent or short-term will, to a large extent, determine the strength and timing of aviation's recovery.

If, in using this document, you see opportunities for improvement, I would appreciate hearing from you. We welcome information and suggestions to improve the usefulness and accuracy of our forecasts and this document.

You are also encouraged to send your comments to me at the Federal Aviation Administration, 800 Independence Avenue, SW, Washington, DC 20591.

Louise Maillett
Acting Assistant Administrator for Policy,
Planning, and International Aviation

ACKNOWLEDGMENTS

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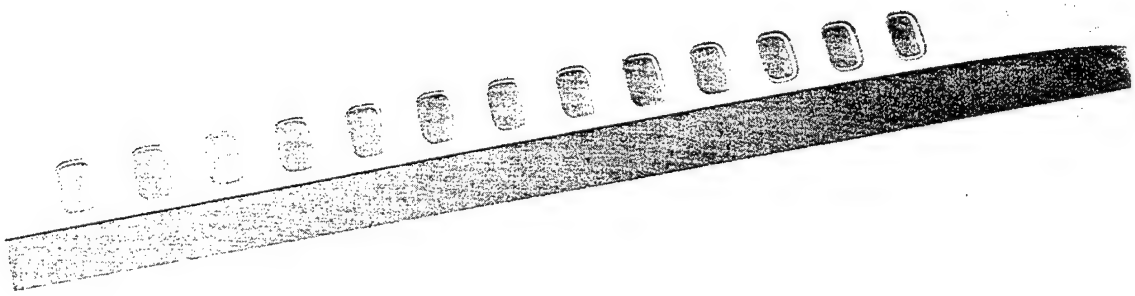


CHAPTER I

EXECUTIVE SUMMARY

A STALLED RECOVERY AND AN UNCERTAIN OUTLOOK

What began as a strong recovery in the demand for aviation services started to wane in the 2nd half of fiscal year (FY) 2002. A sluggish economy, a plunge in equity prices, a raft of allegations of corporate accounting fraud, and increased international tensions all took their toll. Weak traffic demand, coupled with the failure of full-fare business travelers to return in any significant numbers, forced carriers to resort to discounting to fill empty seats, with a devastating impact on both passenger yields and profits. The general aviation industry's 7-year run of increased shipments and billings also came to an end in 2002. Much of the decline in general aviation shipments is the result of a weak economy. Increased numbers of used business jets for sale and stepped-up scrutiny by corporate management of excessive corporate expenses also lessened shipments and billings.

The greatest impact from the September 11th events occurred during the 4th quarter of calendar year (CY) 2001 (the 1st quarter of FY 2002). Normally, there is little difference between calendar and fiscal year results and growth rates. However, there will be large differences in 2002 and over the next several years. Therefore, where appropriate, statistics and growth rates will be noted on both a fiscal and calendar year basis.[1]

THE RECOVERY STALLS: A REVIEW OF 2002

One of the longest running boom times in aviation history came to an abrupt halt on September 11th, 2001. Thus ended a 7-year period when the U.S. and world commercial and civil aviation achieved unprecedented growth in demand for aviation services and profitability. Although the terrorist attacks struck mainly at the United States and, in particular, its aviation industry, it had worldwide effects. As expected,

[1] All stated years and quarters for U.S. economic and U.S. air carrier traffic, and financial data and forecasts are fiscal years (October 1 through September 30); all stated years and quarters for international economic and world traffic and financial data and forecasts are calendar years, unless otherwise denoted. Table I-9 (page I-34) contains summary traffic statistics and growth rates on a calendar year basis.

these events had the greatest impact on the United States—its economy, its air carriers, and its travel markets. However, they affected world economic growth and air travel demand as well.

UNITED STATES AND WORLD ECONOMIC ACTIVITY

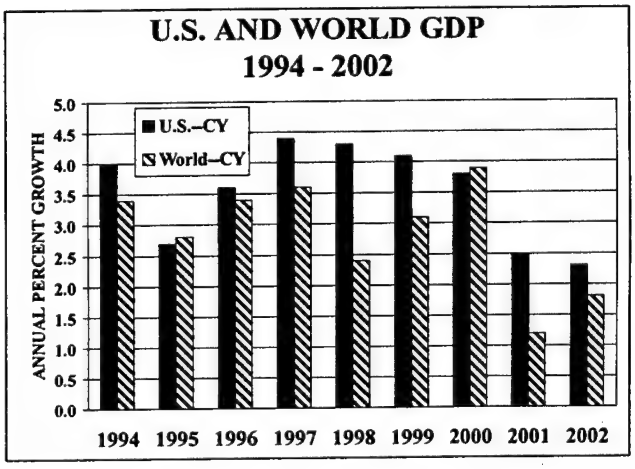
On November 26, 2001, the National Bureau of Economic Research officially announced that in March 2001 the U.S. economy had entered its 10th recession since the end of World War II. However, the severity of the recession was not known until early 2002. Instead of a one quarter decline (down 1.1 percent in 3rd quarter CY 2001) as initially estimated, the economy actually declined for 3 consecutive quarters starting with the 1st quarter of CY 2001. Not coincidentally, the downturn in U.S. domestic passenger and cargo demand also began during this same quarter.

The U.S. experienced an uneven economic recovery in FY-2002. After growing by 2.7 and 5.0 percent during the first 2 quarters of the fiscal year, growth slowed to 1.3 during the 3rd quarter but rebounded strongly to 4.0 percent in the 4th quarter. U.S. Gross Domestic Product (GDP) growth, which averaged 3.3 percent during the 10-year expansion period, has now suffered two consecutive sub-par years—up 0.8 percent in FY 2001 and 1.7 percent in FY 2002. The recovery in 2002 is considered weak compared with previous recovery periods.

U.S. inflation (as measured by the consumer price index) averaged 1.5 percent in FY 2002. The low increase in prices is due, in part, to a 14.1 percent decline in energy prices. However, the recent trend in fuel prices is upward.

Globally, economic gains averaged about a half percentage point less than those of the United States during the past economic expansion. World GDP growth also slowed in the past 2 years, averaging 1.2 percent in 2001 and an estimated 1.8 percent in 2002. The slowdown is partly due to the growing dependency of many world economies on export trade with the United States.

In CY 2002, Canada's economy will grow nearly one-third faster than the United States—up 3.3 percent compared with 2.4 percent. Despite another year of negative growth in Japan (down 0.2 percent), forecasters expect the combined economies of the Asian/Far East nations to grow 2.2 percent in 2002. Japan's weakness is more than offset by China's strong economic activity (up 7.9 percent). The combined economies of Europe, the Middle East, and Africa nations should grow by only 1.2 percent in 2002, partly the result of sluggish growth in western European (up 1.0 percent) countries. Economic growth in Latin American countries, weakened by the financial crisis in Argentina (down 12.2 percent), is forecast to contract by 1.5 percent in 2002.



COMMERCIAL AVIATION

The demand for air travel both within the U.S. and between the U.S. and other world travel regions declined sharply in 2002, forcing both U.S. and foreign flag carriers to cut scheduled flights. Worldwide travel demand, both local and international, also declined during much of

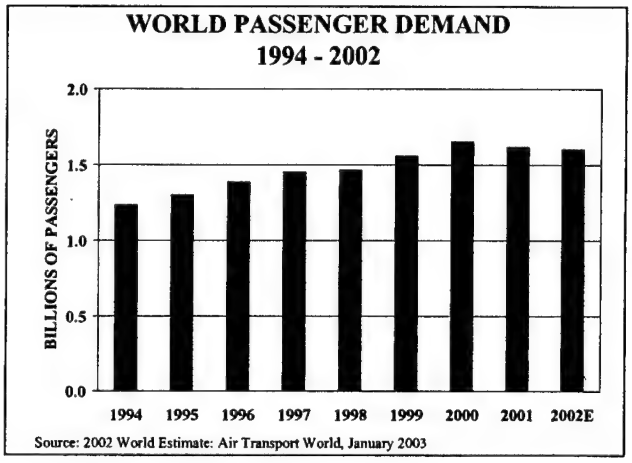
2002, forcing world airlines to also adjust schedules downward.

Just as the impact from the events of September 11th varied among individual countries and world travel areas, so has the timing and strength of the recovery. In addition, there are differing rates of recovery among the operating entities within individual countries, that is, among mainline, low cost, and regional/ commuter carriers. For the most part, it appears that domestic travel recovered faster than international travel and low-cost and regional carriers continued to outperform the larger mainline carriers.

World Travel Demand

Strong growth in both U.S. and world GDP prior to September 11th helped create the strong demand for world aviation services since 1993. Revenue passenger kilometers (RPKs) and passengers were up 6.4 and 5.4 percent annually over the 1994-2000 time period.

In 2001, worldwide RPKs and passengers declined by 2.9 and 2.1 percent respectively. Although worldwide traffic results are not available for 2002, preliminary figures from around the world suggest that worldwide passenger demand is recovering at a somewhat faster pace than is demand in the United States. Air Transport World estimates that world RPKs will decline by only 0.5 percent while the number of passengers carried declines by 0.8 percent.[2] The Association of Asian Pacific Airlines (AAPA) reports an increase of 4.7 percent in RPKs and a decline of 0.2 percent in available seat kilometers (ASKs) for the 11 months ending November 2002. Additionally, it appears that traffic in this region turned positive in May. Statistics published by the Association of European Airlines (AEA) indicate declines of 5.7 percent in RPKs and 9.9 percent in ASKs for the same 11-month period. Some of the largest declines among AEA carriers were on the North Atlantic routes, with RPKs down 9.3 percent and ASKs down 15.8 percent. Intra-European traffic and capacity was down 7.2 and 7.7 percent, respectively, over the 11-month period.

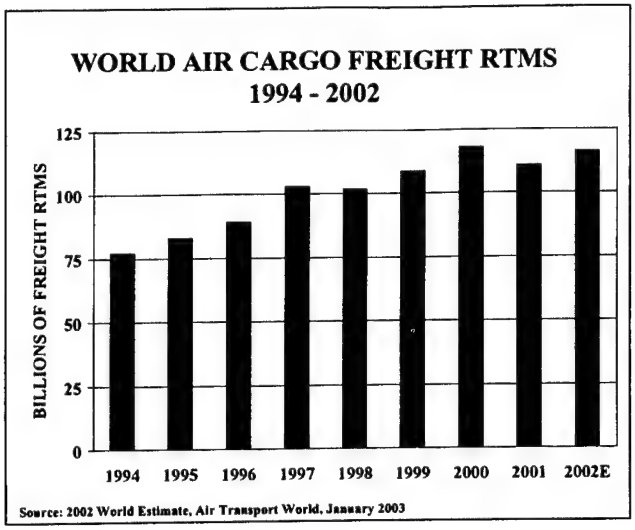


In CY 2002, U.S. and foreign flag carriers combined transported an estimated total of 122.0 million passengers between the United States and the rest of the world, a decline of 5.2 percent from 2001. Passenger traffic volume is expected to decline in all four world travel regions in 2002: Atlantic markets, 43.3 million (down 8.7 percent); Canadian transborder markets, 17.9 million (down 7.8 percent); Asia/Pacific markets, 22.4 million (down 2.4 percent); and Latin American markets, 38.3 million (down 1.2 percent).

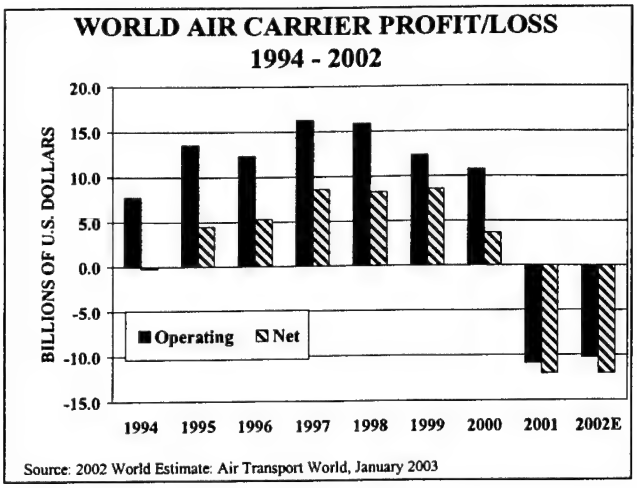
Prior to 2001, air cargo demand had grown at a faster pace than passenger demand, with worldwide freight tonnes and revenue ton kilometers (RTKs) growing an average annual rate of 8.6 and 8.0 percent over the 1994-2000 period. However, slowing U.S. economic activity and imports from key world regions, and the collapse of the high-tech industry and demand for information technology equipment, resulted in significant decline in the demand for air cargo services worldwide in 2001. Freight tonnes and RTKs were down 5.0 and 3.9 percent, respectively. However, worldwide cargo demand appears to be responding

[2] *Air Transport World*, January 2003.

positively to the stronger global economic recovery. Air Transport World estimates that RTKs will increase by 5.0 percent in 2002.[3] For the 11 months ending November 2002, AEA statistics indicate a decline of only 0.9 percent in RTKs. AAPA reports an increase of almost 10.0 percent for the same period.



For the 7-year period ending in 2000, data compiled by the International Civil Aviation Organization (ICAO) shows that world air carriers (including U.S. air carriers) reported cumulative operating and net profits totaling $89.0 and $42.0 billion, respectively. However, the events of September 11th, combined with the worldwide slowdown in economic activity, resulted in record losses in 2001--operating and net losses of $10.9 and $12.0 billion, respectively. Preliminary estimates by Air Transport World indicate that worldwide operating and net losses could total $10.2 and $12.0 billion, respectively, in 2002. U.S. airlines are expected to account for almost all of the projected loss--a $9.8 billion loss in both operating and net profit in CY 2002.



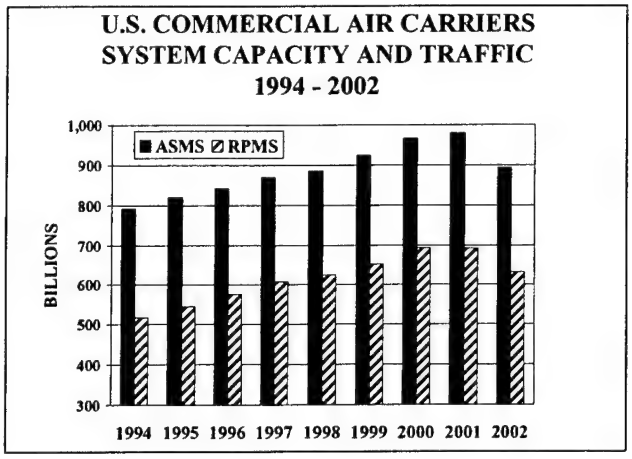
U.S. Travel Demand

Commercial air carriers reduced capacity significantly after the events of September 11th. Although capacity gradually recovered from the low levels flown in the months immediately following the terrorist attacks, capacity has not returned to pre-September 11th levels. In fact, a number of large carriers have significantly reduced capacity levels from those flown during summer 2002.

After growing at an average annual rate of 3.0 percent during the 1994-2000 period. U.S. commercial air carrier (sum of large air carriers and regionals/commuters) system capacity (domestic plus international), as measured by available seat miles (ASMs), increased by only 1.4 percent in 2001 and declined by 8.6 percent in 2002. [4] The level of capacity flown in 2002 is just slightly more than that flown in 1998.

[3] *Air Transport World*, January 2002

[4] In calendar year 2002, it is estimated that U.S. commercial air carriers' system capacity and traffic performed as follows: ASMs down 3.9 percent; RPMs down 2.2 percent; and enplanements down 2.8 percent. The system load factor is expected to average 71.0 percent in 2002



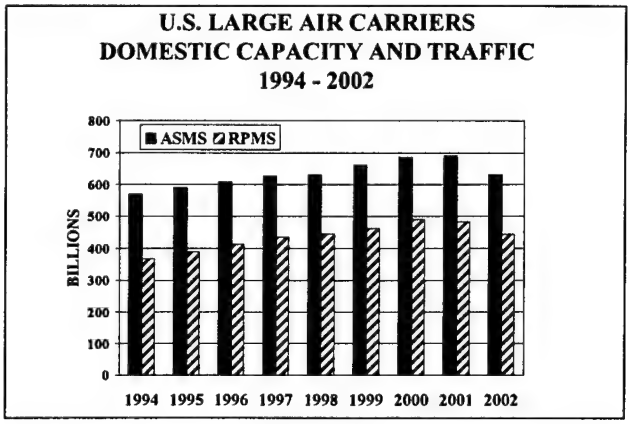
During the 1994-2000 period, U.S. air carrier system revenue passenger miles (RPMs) and passenger enplanements grew at annual rates of 5.1 and 4.4 percent respectively. However, RPMs and enplanements both declined in 2001 and 2002. Passenger enplanements were down 1.8 percent in 2001 and 8.2 percent in 2002 while RPMs declined 0.4 and 8.6 percent over the same time periods. The number of system passengers carried in 2002 is slightly less than the number transported in 1997.

U.S. commercial air carriers achieved a load factor of 71.0 percent in 2002, an increase of 1.2 percentage points over 2001. While this is below the all-time high of 72.1 percent recorded in 2000, it still represents the second highest load factor on record.

Large Air Carriers

In FY 2002, U.S. large air carriers'[5] system ASMs (the sum of domestic and international services) declined by 9.8 percent while passenger demand (RPMs and enplanements) declined 9.7 and 10.5 percent, respectively. The system-wide load factor remained flat at 71.2 percent.

Domestic capacity (50 states, Puerto Rico, and the U.S. Virgin Islands) was down 13.6 percent during the 1st quarter of FY 2002 (October- December), the period most heavily impacted by the events of September 11th. For the whole year, domestic capacity declined by 8.4 percent.[6] The level of domestic capacity flown in 2002 is just slightly more than what was flown in 1998.



Domestic passenger traffic fell even more than capacity in the 1st quarter of FY 2002. RPMs were down 16.9 percent and passenger enplanements down 18.7 percent. For the entire year, domestic RPMs and enplanements declined 8.3 and 10.5 percent, respectively. The number of domestic passengers enplaned in 2002 was fewer than the number enplaned in 1996.

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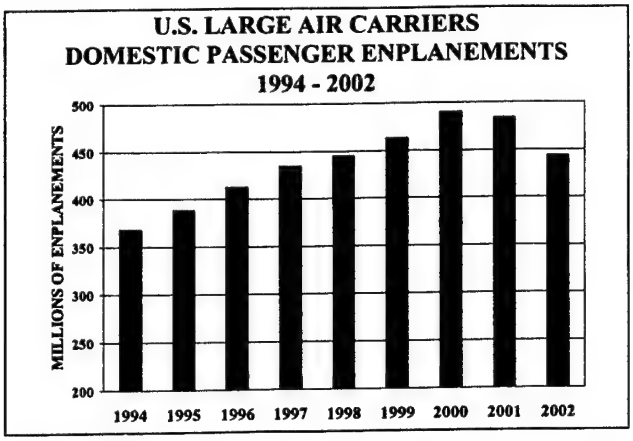
[5] Defined as air carriers whose majority of flights are operated in aircraft having more than 70 seats.

[6] In calendar year 2002, it is estimated that large air carrier domestic capacity and traffic performed as follows: ASMs down 4.0 percent; RPMs down 3.1 percent; and enplanements down 5.6 percent. The domestic load factor is expected to average 70.1 percent in 2002.

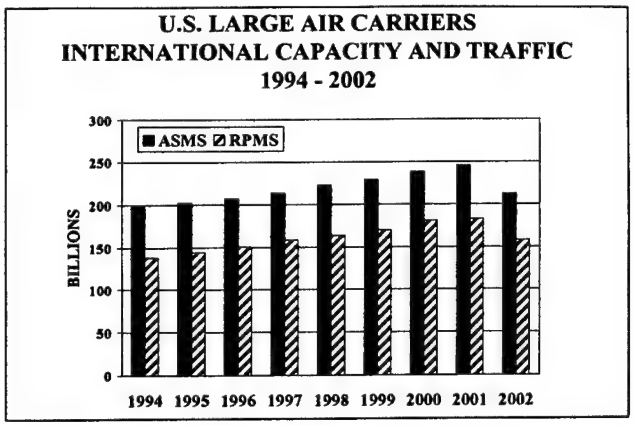


Domestic load factor fell 4.1 percentage points in October and was down 2.6 points for the 1st quarter of the year. For the entire year, domestic load factor averaged 70.0 percent, the same as in 2001.

International ASMs declined 18.0 percent during the 1st quarter of 2002 and were down 13.7 percent for the entire year.[7] Capacity declined in all three world travel regions in 2002--20.0 percent in Pacific markets, 13.9 percent in Atlantic markets, but just 3.8 percent in Latin American markets. The level of international capacity flown in 2002 is just slightly less than in 1997.

International RPMs declined 37.2 percent in October and were down 26.9 percent for the 1st quarter of 2002. For the entire year, RPMs were down 13.5 percent. RPMs were also down in all three world travel regions--17.6 percent in Pacific markets, 13.2 percent in Atlantic markets, and 7.5 percent in Latin American markets. International RPMs were last at the 2002 level in 1997.

[7] In calendar year 2002, it is estimated that large air carrier international capacity and traffic performed as follows: ASMs down 7.9 percent; RPMs down 4.3 percent; and enplanements down 1.7 percent. The international load factor is expected to average 75.8 percent in 2002.



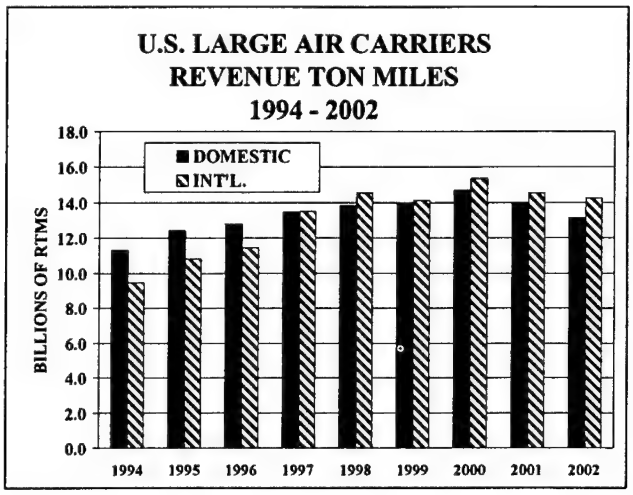
International passenger enplanements declined by 10.1 percent in 2002, with large declines occurring during the 1st quarter (down 23.9 percent) of the year. In 2002, enplanements declined in all three world travel regions; 18.7 percent in Pacific markets, 12.3 percent in Atlantic markets, but only 3.6 percent in Latin American markets.

International load factors averaged 74.6 percent in 2002, up 0.2 percentage points over the previous year.

Added security measures worldwide have affected cargo traffic not only in the months immediately following September 11th, but throughout much of the year as well. U.S. air carriers' air cargo traffic declined 4.0 percent in 2002, with domestic RTMs down 5.9 percent and international RTMs down 2.2 percent.[8] The

[8] In calendar year 2002, it is estimated that domestic and international RTMs increased 4.0 and 3.1 percent, respectively.

recovery in U.S. cargo traffic has been stronger than that of passenger traffic, reflecting, in part, the economic recovery currently underway in the U.S. and the world. However, neither domestic nor international RTMs have returned to the activity levels achieved in 2000.

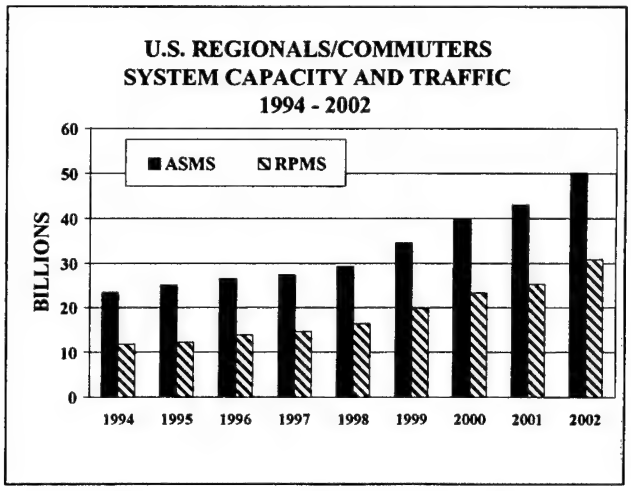


Regionals/Commuters

The impact of September 11th on regional/commuter carriers was generally more positive than negative. This was largely because major air carriers transferred a large number of routes to their regional partners. This allowed the larger carriers to cut capacity while still maintaining presence in these markets. Regional/commuter growth in 2002 was also inflated by the recovery from the lengthy 98-day strike (March 26-July 1) that shut down operations at Comair in 2001.

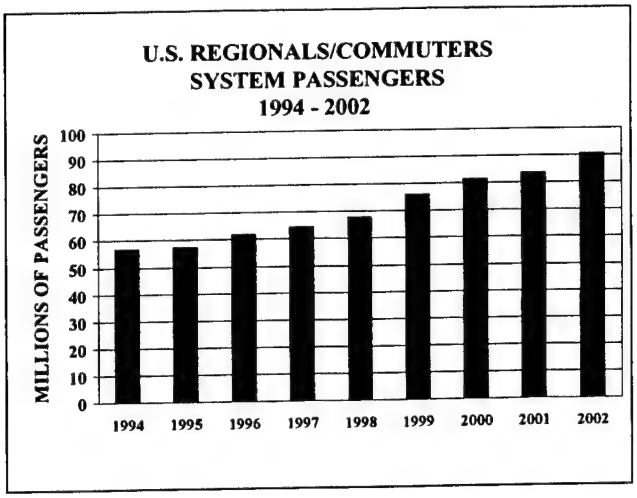
Regional/commuter ASMs were up 16.6 percent in 2002,[9] up 17.7 percent in domestic markets but down 9.5 percent in international markets. Route transfers from the larger domestic partners were often in longer distance, nontraditional markets that could be flown more efficiently by regional jets. As a result, the average flight stage and passenger trip length increased 31.7 and 37.1 miles, respectively, in 2002. The number of regional/commuter departures, by contrast, declined 2.5 percent in 2002.

Regional/commuter traffic also continued to grow in 2002. System RPMs were up 21.9 percent, up 23.1 percent in domestic markets but down 6.9 percent in international markets. Regional/commuter carriers achieved an all-time high load factor of 61.3 percent in 2002, up 2.6 percentage points over 2001.



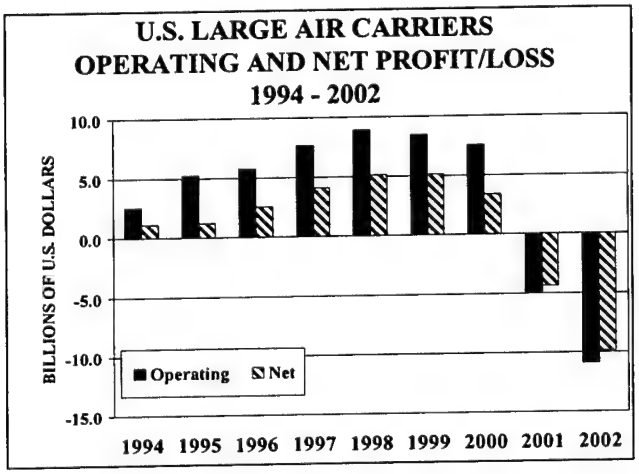
Regionals/commuters enplaned 90.7 million passengers in FY 2002, an increase of 8.5 percent over 2001. Domestic passengers totaled 88.0 million (up 9.4 percent) while international passengers totaled 2.7 million (down 13.7 percent). The large disparity in growth relative to passenger miles is due to the large increase in stage and passenger trip length.

[9] In calendar year 2002, it is estimated that regional/commuter ASMs grew by 20.2 percent, RPMs by 26.9 percent, and enplanements by 13.9 percent. The calendar year load factor is expected to average 61.6 percent.



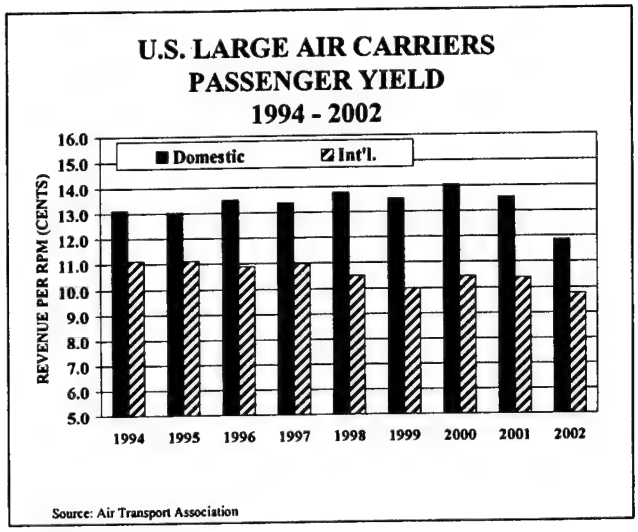
U.S. Air Carrier Financial Results

Prior to the January-March 2001 quarter, large commercial air carriers had strung together 24 consecutive profitable quarters. During that time they reported cumulative operating and net profits of $43.9 and $22.2 billion, respectively. The large carriers have now incurred losses for 7 consecutive quarters, with cumulative and net losses totaling $16.2 and $14.0 billion, respectively. Operating and net losses are expected to total $10.5 and $9.8 billion, respectively, in FY 2002. Losses would have been greater had not the Federal government approved a $5.0 billion emergency aid package for U.S. airlines.



Operating revenues were down 16.3 percent in 2002, due to a combination of declining traffic (RPMs down 9.7 percent) and passenger yields (down 10.8 percent). The large decline in passenger yields is due, in part, to a shift in the mix of traffic from higher fare business travelers to personal/pleasure travel. The decline also reflects continued intense competition from low cost carriers as well as fare reductions to attract flyers during periods of recent weak travel demand.

On the other hand, operating expenses were down only 11.2 percent. Declining fuel prices (down 18.1 percent in FY 2002) and tight cost cutting measures were partially offset by increasing insurance and security costs.



In 2002, only 3 of the 14 majors[10] reported a profit, with operating losses for the group totaling $10.3 billion. Operating results for the majors ranged from a profit of $904.2 (Federal Express) to a loss of $3.8 billion (American/ TWA). The three cargo carriers[11] reported combined operating profits of $1.0 billion while the 11 passenger airlines reported combined operating losses of almost $11.2 billion. Four carriers--American, Delta, United and

[10] Defined by the U.S. DOT as carriers with annual operating revenues greater than $1 billion. Includes TWA for 1st quarter FY 2002 but does not include American Eagle whose financial results are reported with the regionals/commuters.

[11] DHL, Federal Express, and United Parcel.

US Airways--accounted for more than 85 percent of the passenger carriers' total losses.

The financial results of many of the smaller nationals and regionals[12] also worsened in 2002, with 28 of the 44 reporting carriers incurring operating losses. Nationals and regionals reported an operating loss of $303.9 million in 2002, with earnings ranging from an operating profit of $78.2 million (JetBlue) to an operating loss of nearly $84.8 million (Sun Country).

Low-cost, low-fare, new entrant carriers continue to have mixed financial results, but several of the stronger carriers reported profitable operations in 2002. AirTran, Frontier, and JetBlue had combined profits of $84.5 million.

Six carriers filed for Chapter 11 bankruptcy and/or ceased operations since September 11th. Federal emergency funds may have averted other bankruptcy filings. Also, the government's Air Transportation Stabilization Board, with a total of $10 billion provided for U.S. government-backed loan guarantees, approved and finalized three loan guarantees and conditionally approved another three applications[13], either averting Chapter 11 filings or allowing bankrupt carriers to restructure and continue operations

The regional/commuter airline industry posted an operating loss of $346.6 million for the 12 months ending March 31, 2002, a deterioration of $730 million from the $384.0 million profit recorded over the same 12 month period a year earlier.[14] Most of the loss occurred during the 6-month period ending December 2001 ($356.2 million) and largely reflects the impact of the events of September 11th. Regional/commuter carriers reported a profit of 72.5 million for the quarter ending March 2002. In addition, preliminary data indicates that the industry should be profitable over the next 2 quarters and most likely will report an operating profit for full year FY 2002.

U.S. Commercial Air Carrier Fleets

In the immediate aftermath of the terrorist attacks, many larger airlines grounded large numbers of older less efficient aircraft and deferred scheduled delivery of new aircraft over the next several years. Many of the larger carriers continued to ground aircraft throughout the year as they restructured to cut costs. At the end of CY 2002, AirClaims data shows that a total of 566 aircraft sit idle in the desert.[15]

The number of aircraft in the U.S. commercial air carrier fleet totaled 7,735 in 2002--4,180 large air carrier passenger jets (over 70 seats), 1,034 cargo jets, and 2,521 regional/ commuter passenger aircraft. The large carrier passenger jet fleet has fallen by 292 aircraft since 2000--down 137 aircraft in 2001 and 155 aircraft in 2002. The cargo fleet declined by 30 aircraft over the past 2 years while the regional/ commuter fleet increased by 247 aircraft--89 in 2001 and 158 in 2002. Over the past 2 years, the regional/commuter piston and turboprop fleet fell by 215 aircraft while the number of regional jets increased by 462 aircraft.

Orders for commercial jet aircraft worldwide totaled only 407 during the first 3 quarters of

[12] The U.S. DOT defines nationals as carriers with annual operating revenues between $100 million and $1 billion; regionals as carriers with annual operating revenues less than $100 million.

[13] Loan guarantees have been approved for America West ($380 million), America Trans Air ($148.5 million), and Aloha Airlines ($40.5 million). Conditional approval has been given for loans to US Airways ($900 million), Frontier Airlines ($63 million), and Evergreen International ($90 million).

[14] Regional/commuter carriers reported an operating loss of $282.6 million in FY 2001.

[15] *Aviation Daily*, Monday, January 13, 2003

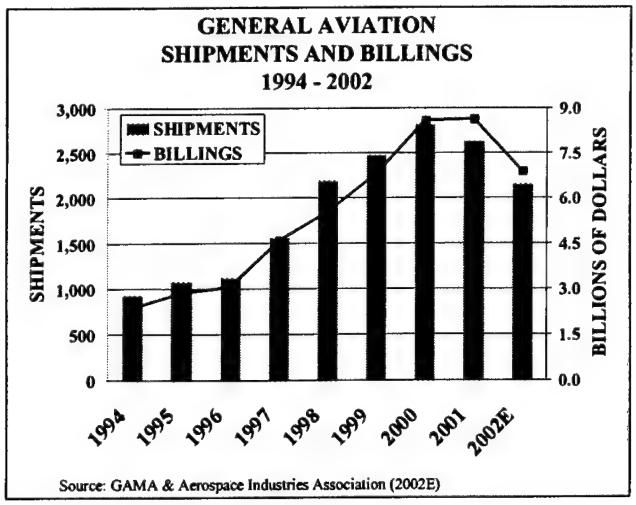
2002, a 51.4 percent decline from the same period in 2001. Orders for the smaller regional jets (37 to 70 seats) totaled only 75 during 2002, a 76.3 percent decline from the 316 aircraft ordered during the first 9 months of 2001. Although regional jet orders have slowed over the past several years, all signs are that they will continue to be the fastest growing segments of the industry over the next several years.

Manufacturers delivered 719 commercial jet aircraft worldwide during the first 3 quarters of 2002, a 17.3 percent decline over the same period in 2001. This included delivery of 211 regional jets, a 54.8 percent decline from the same period in 2001.

GENERAL AVIATION

The turnaround in the general aviation industry that began with the passage of the General Aviation Revitalization Act in 1994 encountered setbacks in 2002. The events of September 11th and their aftermath did impact the demand for general aviation products and services, both negatively and, in some cases, positively. Many of the "no-fly zone" and other restrictions placed on the operation of general aviation aircraft remain in effect today, including denial of access to Washington National Airport. However, the continued weak U.S. economy, declining industry profits, and increased corporate accountability, may account for a large part of the declining demand for general aviation aircraft in 2002.

Based on reports released by the General Aviation Manufacturers Association (GAMA), industry shipments and billings both declined during 2002. During the first 3 quarters of CY 2002, aircraft shipments declined 16.9 percent and billing were down 25.2 percent. Business jet shipments were down 5.6 percent during the same period, the first reported decline since 1996. The Aerospace Industries Association of America (AIAA) expects general aviation aircraft shipments to total 2,153 in 2002, a decline of 17.7 percent. AIAA also projects that industry billings will decline 13.8 percent to $6.9 billion in 2002,[16] the first reported decline since 1994.



Even with restrictions on the operation of general aviation aircraft following September 11th, general aviation activity at FAA air traffic facilities was, for the most part, flat in 2002. Operations at combined FAA and contract towers declined just 0.1 percent in 2002, with itinerant operations down 0.1 percent and local operations down 0.2 percent. Instrument activity at combined FAA and contract towers declined 0.2 percent

The number of general aviation IFR aircraft handled at FAA en route centers was up 1.9 percent in 2002. Restrictions placed on VFR flying in effect forced previous VFR operations to file flight plans and fly IFR. As a result, flight services at FAA flight service stations also increased in 2002, the first recorded increase since 1989.

The FAA's 2001 General Aviation and Air Taxi Activity and Avionics Survey reported declining general aviation activity levels for a

[16] *2002 Year-end Review and 2003 Forecast—An Analysis*, Aerospace Industries Association of America, December 2002.

2nd consecutive year, this following 5 years of continuous growth. The general aviation active fleet and hours flown declined 2.8 and 5.9 percent, respectively, in CY 2001. According to the 2001 Survey, the active general aviation fleet totaled 211,447 and flew an estimated 29.1 million hours. Based on reported general aviation activity counts at FAA air traffic facilities, the FAA projects that the active fleet will decline an additional 0.2 percent in CY 2002. The FAA also projects that general aviation hours flown will increase 1.1 percent in CY 2002, with most of the increase expected to occur among the turbine powered aircraft fleet.

Business and corporate aviation continues to be a bright spot for the general aviation industry. Increased growth in fractional ownership companies and corporate flying has continued to expand the market for jet aircraft, though at reduced annual numbers. Numerous trade journal articles suggest that the fallout from September 11th has spurred interest in fractional or corporate aircraft ownership and provided new growth opportunities for the on-demand charter industry. However, little hard data exists to either confirm or quantify the increased interest.

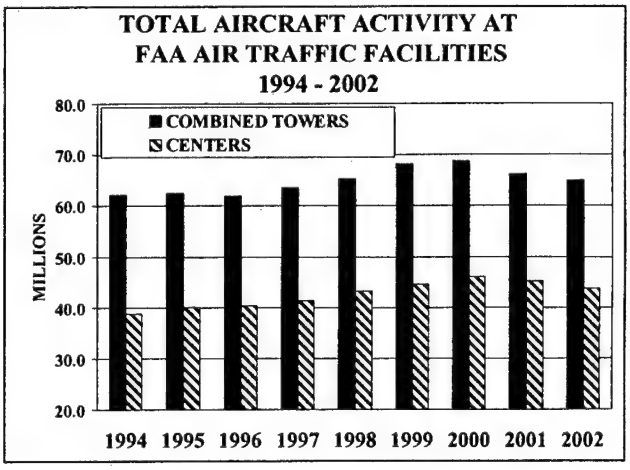
The key to the future of general aviation is increased numbers of student pilots. Unfortunately, the latest FAA Registry statistics (January 4, 2003) show that the number of student pilots declined 8.9 percent in 2002, from 94,420 in 2001 to 85,991. However, it is assumed that much of this decline is due to the restrictions placed on flight schools and student pilot training after September 11th, particularly with regard to foreign students.

The industry has, over the past several years, instituted a number of industry-wide programs designed to attract new pilots to general aviation. The future of the general aviation industry will depend, in large part, on how successful the industry is in continuing to rebuild and stimulate new interest in these programs.

FAA WORKLOAD

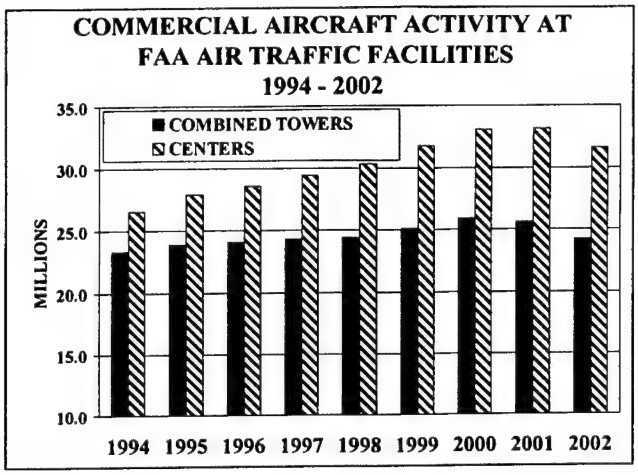
During the 1997-2000 time period, demand for both commercial and general aviation services at FAA air traffic facilities expanded significantly. Activity was up 2.6 percent annually at combined FAA and contract towers and 3.3 percent a year at en route centers. This growth led to the delays experienced at many U.S. commercial airports in 2000 and 2001.

For most U.S. airports, delays ceased to be a major problem on September 11th. During 2002, total activity at combined FAA and contract tower airports (64.9 million) declined by 2.0 percent. The number of IFR aircraft handled at en route centers (43.7 million) declined 3.3 percent. At the end of 2002, combined activity at FAA and contract towers was 5.5 percent below the peak activity level recorded in 2000. Activity at FAA en route centers is 5.0 percent below its 2000 peak.



Commercial activity (air carrier and commuter/air taxi) at combined FAA and contract towers and en route centers declined 5.5 and 4.6 percent, respectively, in 2002. Air carrier operations at towered airports declined 10.5 percent to a total of 13.2 million, its lowest activity level since 1994. The number of air carrier aircraft handled at FAA en route centers declined 8.2 percent to 22.8 million, the lowest level since 1997. Commuter/air taxi activity

was up 1.4 percent at towered airports and 6.1 percent at en route centers in 2002.



Noncommercial activity (general aviation and military) at combined FAA and contract towers was up 0.2 percent in 2002, largely the result of a 5.0 percent increase in military operations. The number of noncommercial aircraft handled at FAA en route centers was up 0.3 percent, due in large part to a 2.0 percent increase in general aviation activity.

The number of traditional (nonautomated) services provided at FAA Flight Service Stations (FSS) totaled 29.4 million in 2002, the first recorded increase (up 0.4 percent) since 1989. All categories of flight services increased in 2002: flight plans originated, up 0.4 percent; pilot briefings, up 0.5 percent; and aircraft contacted, up 0.3 percent.

FAA AEROSPACE FORECASTS FISCAL YEARS 2003 - 2014

The challenges in developing this year's aviation forecasts have been no less demanding than those faced last year. Last year's efforts were hindered by a general lack of timely data and specific information on the industry's future plans. This year we have a wealth of data to analyze as well as announced future capacity plans from most major carriers. However, the uncertainties and challenges confronting the aviation industry have become considerably more complex and difficult to quantify. Nevertheless, the FAA has developed a set of assumptions and forecasts we believe are consistent with recent trends and expected changes in the aviation industry.

Once again, the aviation forecasts and assumptions have been developed around 3 distinct time periods. The major difference from last year is that the period of recovery has been extended for one to two additional years. Forecasts and assumptions have been developed for each of the three major user groups—large air carriers, regionals/ commuters, and general aviation—based around the following set of assumptions.

Fiscal Year 2003—Most user groups can expect modest recovery as each group attempts to redefine itself in the post September 11th operating environment and new industry realities. The focus will be on restructuring and tight cost reductions to bring costs in line with reduced demand and increased competition from low cost carriers. However, profitability remains elusive to most user groups in 2003.

Fiscal Year 2004—The aviation industry approaches equilibrium between expenses and revenues and begins to develop strategies to take advantage of the recovery in both economic activity and the demand for aviation products and services. Most of the industry should return to profitability in 2004.

Fiscal Years 2005 to 2014—This period features a return to more stable levels of growth in the demand for aviation products and services. However, the industry may bear very little resemblance to the structure that was in place before September 11th, both in cost structure and its cast of players. Levels of demand are not expected to reach previous long-term growth rates.

The main assumption in this year's forecasts is no further successful terrorist incidents against U.S. or world aviation. Also, we have not assumed a war with Iraq nor a major contraction of the industry through bankruptcy or consolidation.

The starting point for the commercial aviation forecasts (air carriers and regionals/commuters) was the future schedules published in the Official Airline Guide (OAG). Using monthly schedules allowed FAA forecasters to develop capacity and demand forecasts on either a monthly (large air carrier) or quarterly (regionals/commuters) basis for the year 2003 and then to extract these schedules/demand forecasts into 2004.

A major assumption in last year's forecasts was that the long-term relationships inherent in the forecast models have not changed substantially. Based on last year's results and the changes occurring within the industry, this assumption may no longer be valid. The large air carrier models were re-estimated this year and the results do predict slower long-term growth than forecast in previous years. The large air carrier forecasts for the years 2005 to 2014 were derived from the growth rates predicted by this new model.[17]

This year FAA forecasters benefited immensely from the September 2000 12th FAA/Transportation Research Board (TRB) International Workshop on Future Aviation Activities. Invited industry participants from all aviation sectors critiqued updated 2002 forecasts and provided direction and guidance on industry assumptions and forecasts for the period out to 2010. Besides the FAA/TRB workshop, FAA forecasters held discussions with individual carriers, aircraft and engine manufacturers, aviation associations, and other industry experts to gain additional insight and guidance on current trends and future aviation demand.

ECONOMIC FORECASTS

The Executive Office of the President, Office of Management and Budget (OMB) provides the economic forecasts used by the FAA to project domestic aviation demand. In addition, the FAA uses the U.S. macro economic projections of the Congressional Budget Office (CBO) as well as those of Global Insight, Inc. (formerly DRI-WEFA, Inc.), a commercial forecasting service. These alternative forecasts provide the FAA with a range of economic forecasts to gauge the risk associated with variations from the OMB projections. The FAA uses the world and individual country economic projections provided by Global Insight to forecast the demand for international aviation services.

In any given year there are likely to be variations around the long-term trend. None of the current economic models used by the FAA are precise enough to predict interim business cycles. In addition, no forecaster can predict the precise timing of discontinuous developments such as the 1991 Gulf War, the 1997-98 Southeast Asia financial crisis, the 1998 Northwest Airlines' strike, or the September 11th terrorist attacks.

The projected growth of aviation demand in this and following chapters is consistent with the national short- and long-term economic growth forecasts discussed in greater detail in Chapter II. Table I-1 (page I-15) summarizes the key U.S. and world economic assumptions used to develop the domestic and international aviation demand forecasts. Table I-9 (page I-34) provides economic projections for GDP and oil prices by calendar year. Annual historical data and economic forecasts are presented in tabular form in Chapter X, Tables 1 through 5.

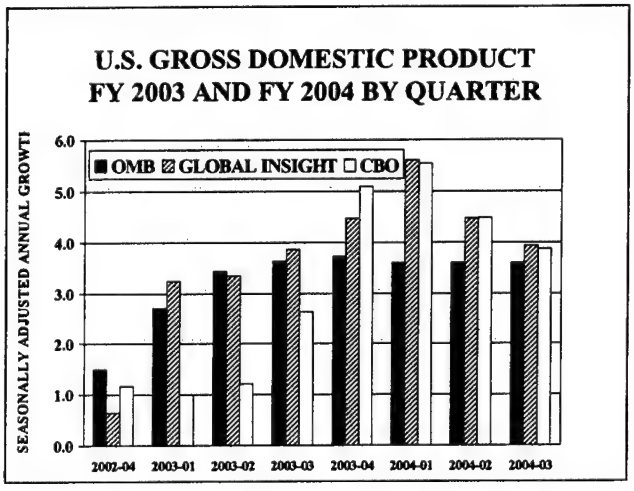
[17] A description of the air carrier model can be found in Appendix A.

United States Economy

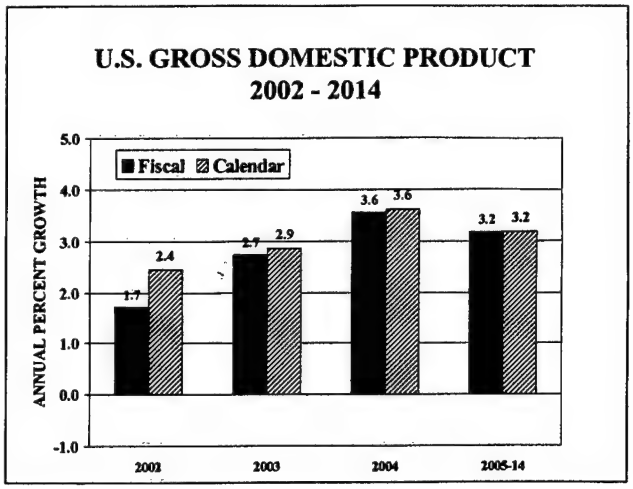
While the three economic projections used by the FAA agree on the general direction of the U.S. economy—a strong recovery beginning in 2003 and moderate long-term growth—they disagree on the timing and strength of the recovery. They also differ on future energy prices.

The OMB economic forecasts project the economy will grow by only 1.5 percent during the 1st quarter of FY 2003, then average almost 3.3 percent growth over the last 3 quarters of the year. OMB expects this strong growth to continue over the next several years, expanding by 3.6 percent in both 2004 and 2005.

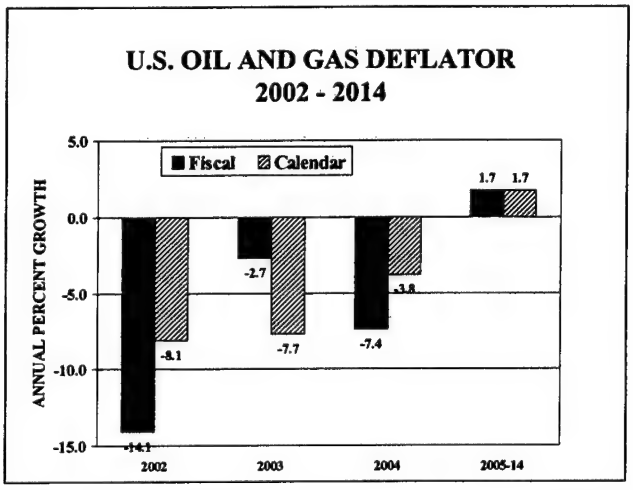
CBO and Global Insight both forecast a slower recovery in 2003, but higher growth in 2004 and 2005. CBO forecasts the economy will grow just over 1.1 percent during the first 3 quarters of 2003, 3.8 percent in 2004, and 3.7 percent in 2005. Global Insight assumes growth of 2.6 percent in 2003, 4.3 percent in 2004, and 3.9 percent in 2005.



Over the entire 12-year forecast period, OMB projects U.S. real GDP to grow at annual rates of 3.2 percent. CPO and Global Insight forecast growth averaging 3.1 and 3.3 percent, respectively, over the same period.



OMB projects that energy prices (as measured by the oil and gas deflator) will decline by 2.7 percent in 2003 and 7.4 percent in 2004, then increase at an annual rate of 1.7 percent over the remainder of the forecast period. Over the entire 12-year period, the OMB forecast assumes that nominal energy prices will increase by only 0.5 percent annually. In real terms, OMB expects energy prices to decline at an annual rate of 1.7 percent over the 12-year period. CBO forecasts a 3.4 percent annual increase in nominal fuel prices--an annual increase of 1.0 percent in real prices. Global Insight projects nominal fuel prices to increase by 2.3 percent a year—no increase in real terms.



OMB projects that consumer price increases (as measured by the Consumer Price Index) will remain at relatively low rates throughout the forecast period, averaging 2.2 percent annually.

TABLE I-1

ECONOMIC FORECASTS
UNITED STATES AND WORLD

FISCAL YEARS 2003-2014

ECONOMIC VARIABLE	HISTORICAL			FORECAST			PERCENT AVERAGE ANNUAL GROWTH				
	1995	2001	2002	2003	2004	2014	95-02	01-02	02-03	03-04	02-14
UNITED STATES											
Gross Domestic Product--Chain Weighted (BIL 1996$)	7,503.6	9,213.3	9,372.1	9,629.3	9,972.1	13,642.7	3.2	1.7	2.7	3.6	3.2
Consumer Price Index (1982-84 = 100)	151.4	176.3	178.9	182.9	186.6	233.1	2.4	1.5	2.2	2.0	2.2
Oil & Gas Deflator (1996 = 100)	95.2	122.8	105.4	102.5	95.0	112.5	1.5	(14.1)	(2.7)	(7.4)	0.5
INTERNATIONAL											
Gross Domestic Product (In Billions of U.S. 2000$)											
World	26,669.0	31,716.7	32,293.1	33,200.9	34,434.0	47,615.7	2.8	1.8	2.8	3.7	3.3
Canada	590.3	727.7	751.7	777.0	806.0	1,070.3	3.5	3.3	3.4	3.7	3.0
Europe*	8,732.2	10,176.3	10,303.5	10,511.2	10,819.4	14,195.0	2.4	1.2	2.0	2.9	2.7
Latin America/Mexico	1,563.0	1,825.3	1,798.8	1,838.1	1,906.8	2,881.3	2.0	(1.5)	2.2	3.7	4.0
Pacific**	7,091.9	8,378.7	8,562.1	8,872.0	9,197.8	13,142.7	2.7	2.2	3.6	3.7	3.6
EXCHANGE RATES											
(U.S.$/Local Currency)											
Canada	0.729	0.646	0.636	0.666	0.703	0.775	(1.9)	(1.4)	4.7	5.6	1.7
Euro	NA	0.895	0.939	0.980	1.047	1.150	NA	5.0	4.3	6.9	1.7
United Kingdom	1.577	1.441	1.502	1.600	1.621	1.667	(0.7)	4.2	6.6	1.3	0.9
Japan***	10.631	8.229	7.979	8.199	8.442	9.942	(4.0)	(3.0)	2.8	3.0	1.8

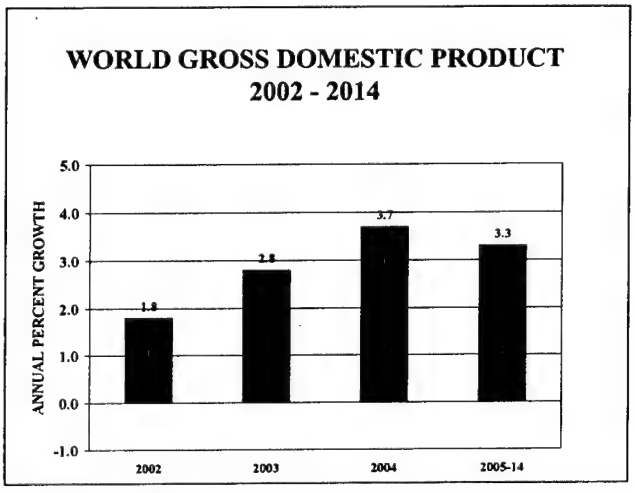
Source: United States: FY 1995-2013; Executive Office of the President, Office of Management and Budget
FY 2014; Consensus growth rate of Global Insight
International: CY-1995-2014, Global Insight

* Sum of GDP for Europe, Africa, and Middle East
** Sum of GDP for Japan, Pacific Basin, China, Other Asia, Australia, and New Zealand
*** U.S.$ per 1,000 Yen

CBO and Global Insight assume average annual rates of 2.4 and 2.3 percent, respectively, over the 12-year forecast period.

World Economy

Worldwide economic growth should grow moderately in 2003 (up 2.8 percent), then expand by 3.7 and 3.5 percent, respectively, in 2004 and 2005. Over the entire 12-year forecast period, worldwide economic growth should exceed that of the United States by only 0.1 percentage points yearly, increasing at an average annual rate of 3.3 percent. Economic growth is forecast to be greatest in the Latin American and Asia/Pacific regions, expanding at annual rates of 4.0 and 3.6 percent, respectively. Economic growth in Canada and Europe/Africa/Middle East countries are expected to average 3.0 and 2.7 percent, respectively, over the forecast period.



AVIATION TRAFFIC AND ACTIVITY FORECASTS

The large commercial air carrier traffic and activity forecasts are summarized in Table I-2 (page I-19) and the forecast assumptions in Table I-3 (page I-20). Chapter III contains a detailed discussion of the forecasts and underlying assumptions. Chapter X--Tables 6 through 18, 20, 22 and 23--contains year-to-year historical data and forecasts.

Table I-4 (page I-23) summarizes the regional/commuter forecasts and assumptions. Chapter IV provides a detailed discussion of the forecasts and assumptions. Chapter X--Tables 24 through 28--provides year-to-year historical and forecast data.

Table I-5 (page I-25) summarizes the air cargo forecasts. Chapter III (page III-15, and pages III-46 to III-52) provides a detailed discussion of the forecasts and assumptions. Tables 19 and 21 (Chapter X) provides year-to-year historical and forecast data.

Table I-6 (page I-28) summarizes the general aviation forecasts. Chapter V provides detailed discussions of the forecasts and assumptions. Chapter X--Tables 29 through 33--provides year-to-year historical data and forecasts.

Table I-9 (page I-34) provides summary domestic and international traffic forecasts on a calendar year for large air carriers, regionals/commuters, and air cargo carriers.

Commercial Aviation

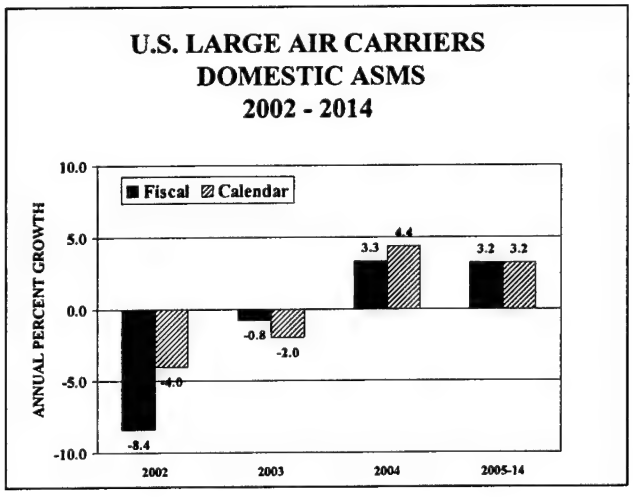
In 2002, the U.S. commercial aviation industry, consisting of large air carriers and regional/commuter airlines, flew 894.9 billion ASMs, a decline of 8.6 percent from 2001. These carriers enplaned 627.6 million passengers (down 8.2 percent) who flew 632.1 billion RPMs (down 8.6 percent).

In 2014, FAA expects U.S. commercial air carriers to fly a total of almost 1.4 trillion ASMs (up 3.6 percent annually). They will transport nearly 1.0 billion passengers (up 3.9 percent

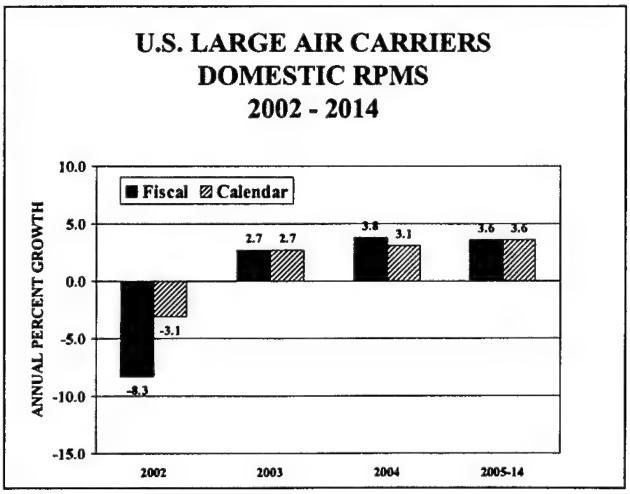
annually) almost 1.0 trillion passenger miles (up 4.1 percent annually).

Large Air Carriers
Domestic Capacity and Traffic

After September 11th, most U.S. air carriers immediately reduced domestic capacity approximately 20 percent across the board. At the end of FY 2002, domestic capacity remained 8.4 percent below 2001 levels and 8.0 percent below 2000 levels. Domestic capacity is forecast to decline 0.8 percent in 2003, largely in response to extensive route restructuring by the larger majors, most notably United Airlines and US Airways. Domestic capacity is projected to increase 3.3 percent in 2004, 3.5 percent in 2005, and 3.0 percent in 2006, effectively returning to pre-September 11th levels in 2006. Thereafter, capacity is expected to increase at an average annual rate of 3.2 percent over the final 8 years of the forecast period.



Domestic air carrier RPMs and passenger enplanements are forecast to increase at average annual rates of 3.6 and 3.5 percent, respectively, over the 12-year forecast period. Domestic RPMs are forecast to increase by 2.7 percent in 2003, 3.8 percent in 2004, and to average 3.6 percent growth over the remaining 10 years of the forecast period. Domestic enplanements are projected to increase by 2.0 percent in 2003, 4.7 percent in 2004, and 3.5 percent annually over the 2005-2014 time period. Domestic RPMs are projected to return to pre-September 11th levels in 2005, enplanements in 2006.



The domestic load factor, flat at 70.0 percent in 2002, is expected to increase to 72.5 percent in 2003 and to 72.9 percent in 2004. Domestic load factors are projected to continue to increase throughout the forecast period, reaching 75.5 percent in 2014.

Domestic passenger yields, which declined by 12.4 percent in 2002, are forecast to increase by 3.3 percent in 2003, 5.3 percent in 2004, and then grow at an average annual rate of 0.9 percent over the remaining 10 years of the forecast period. Nominal domestic yields are not expected to return to pre-September 11th levels until 2012. In real terms, yields are projected to increase by 1.0 percent in 2003, 3.2 percent in 2004, then decline an average of 1.4 percent over the remainder of the forecast period.

The decline in real yields over the latter years of the forecast is based on the assumption that competitive pressures will continue to exert pressure on carriers to hold the line on fare increases. Competition in domestic markets will come from established low-fare carriers such as Southwest, as well as smaller low-cost carriers such as AirTran, Frontier, and JetBlue.

Large air carrier aircraft operations, which declined by 10.5 percent in 2002, are forecast to decline by 2.0 percent in 2003, then increase by 3.3 percent in 2004 and 2.8 percent in 2005. Thereafter, air carriers operations grow at an average annual rate of 2.6 percent over the remaining 9 years of the forecast period. However, air carrier operations are not expected to return to pre-September 11th activity levels until 2009/2010. The slower growth in activity at FAA air traffic facilities relative to expected traffic growth (2.2 versus 3.5 percent growth in domestic enplanements) reflect increased efficiencies in three operational measures.

The average domestic aircraft is forecast to increase by 0.9 seats annually, from 147.9 seats in 2002 to 159.2 seats in 2014. Domestic load factors are expected to increase from 70.0 percent in 2002 to 75.5 percent in 2014. The passenger trip length increased 22 miles in 2002 and is projected to increase another 6.0 miles in 2003. Much of this increase is because the larger air carriers continue to transfer many of their shorter distance routes to their regional affiliates. As demand recovers, the larger carriers are expected to resume operation of some of these routes. As a result, the average domestic passenger trip length is forecast to decline from 913.6 miles in 2003 to 905.5 miles in 2007. After that, the average trip length is expected to increase gradually, reaching 913.8 miles in 2014.

Large Air Carriers
International Capacity and Traffic

FAA provides forecasts of total passenger traffic (sum of U.S. and foreign flag carriers) for travel between the United States and three world travel areas--Atlantic, Latin America (including Mexico and the Caribbean), and Asia/Pacific--as well as for U.S./Canadian transborder traffic. These forecasts are based on historical passenger statistics obtained from the United States Immigration and Naturalization Services (INS) and Transport Canada and on regional world historical data and economic projections obtained from Global Insight.

Total passenger traffic between the United States and the rest of the world is estimated to total 122.0 million in CY 2002, a decline of 5.2 percent from 2001. Passenger traffic is expected to increase 4.6 percent in 2003, 4.8 percent in 2004, and to average 4.6 percent over the rest of the 10-year forecast period, reaching 210.4 million in 2014. Total traffic between the U.S. and the rest of the world is expected to return to pre-September 11th levels in 2005.

Over the entire forecast period, passenger demand is expected to be strongest in Latin American and Pacific markets, growing at an annual rate of 5.0 and 4.9 percent, respectively. Passenger traffic is projected to grow 4.7 percent annually in Atlantic markets and 3.2 percent a year in Canadian transborder markets.

In the aftermath of the September 11th terrorist attack, U.S. air carriers, over a period of several weeks, reduced international capacity by approximately 17 percent. At the end of 2002, international capacity remained 13.7 percent below 2001 levels. International capacity is forecast to increase 3.1 percent in 2003, 2.1 percent in 2004, and 5.5 percent in 2005. Thereafter, capacity increases 4.2 percent annually over the last 9 years of the forecast period. The relatively slow growth in 2003 and 2004 largely reflects route restructuring by the major carriers, especially United Airlines following its filing for Chapter 11 bankruptcy.

TABLE I-2

AVIATION DEMAND FORECASTS
LARGE AIR CARRIERS--PASSENGERS

FISCAL YEARS 2003-2014

AVIATION ACTIVITY	HISTORICAL			FORECAST			PERCENT AVERAGE ANNUAL GROWTH				
	1995	2001	2002	2003	2004	2014	95-02	01-02	02-03	03-04	02-14
U. S./Foreign Flag Carriers 1/											
Total Passengers to/from											
United States (Millions)	104.8	128.7	122.0	127.7	133.8	210.4	2.2	(5.2)	4.6	4.8	4.6
Atlantic	37.0	47.5	43.3	45.5	48.2	75.4	2.3	(8.7)	4.9	5.9	4.7
Latin America	32.1	38.8	38.3	39.9	41.6	68.8	2.5	(1.2)	4.1	4.3	5.0
Pacific	20.8	23.0	22.4	23.4	24.3	39.9	1.1	(2.4)	4.2	4.0	4.9
Canadian Transborder	14.8	19.4	17.9	18.9	19.8	26.3	2.7	(7.8)	5.6	4.5	3.2
U.S. Air Carriers											
Enplanements (Millions)											
Domestic	474.3	546.3	488.8	498.8	522.1	738.4	0.4	(10.5)	2.0	4.7	3.5
International	47.6	53.5	48.1	50.7	51.6	83.6	0.1	(10.1)	5.4	1.7	4.7
Atlantic	16.2	20.5	18.0	18.7	19.0	29.7	1.4	(12.3)	4.3	1.4	4.3
Latin America	17.1	21.7	20.9	22.3	22.9	37.9	2.9	(3.6)	6.7	2.4	5.1
Pacific	14.3	11.4	9.2	9.7	9.7	16.0	(6.1)	(18.7)	4.5	0.9	4.7
System	522.0	599.9	536.9	549.5	573.7	822.1	0.4	(10.5)	2.3	4.4	3.6
RPMs (Billions)											
Domestic	387.8	483.8	443.6	455.6	473.0	674.8	1.9	(8.3)	2.7	3.8	3.6
International	144.2	182.3	157.7	164.5	168.3	278.4	1.3	(13.5)	4.3	2.4	4.8
Atlantic	64.4	86.2	74.8	78.2	79.9	128.8	2.2	(13.2)	4.5	2.2	4.6
Latin America	24.3	36.6	33.9	35.3	36.4	63.8	4.9	(7.5)	4.2	3.2	5.4
Pacific	55.5	59.4	49.0	51.0	52.0	85.7	(1.8)	(17.6)	4.0	2.0	4.8
System	532.0	666.1	601.3	620.1	641.4	953.2	1.8	(9.7)	3.1	3.4	3.9
Fleet (Large Jets Only) 1/											
Passenger	3,897	4,335	4,180	4,129	4,093	5,261	1.0	(3.6)	(1.2)	(0.9)	1.9
Hours Flown (Millions)* 1/	12.0	14.4	12.9	12.8	13.2	18.7	1.0	(10.0)	(0.9)	3.1	3.1

Source:1995-2002; U.S. Air Carriers, Form 41, U. S. Department of Transportation; Total Passengers, INS Form I-92, U.S. Department of Commerce
2003-2014; FAA Forecasts

1/ Historical and forecast on a calendar year basis

* Includes both passenger (excluding regional jets) and cargo aircraft.

TABLE I-3

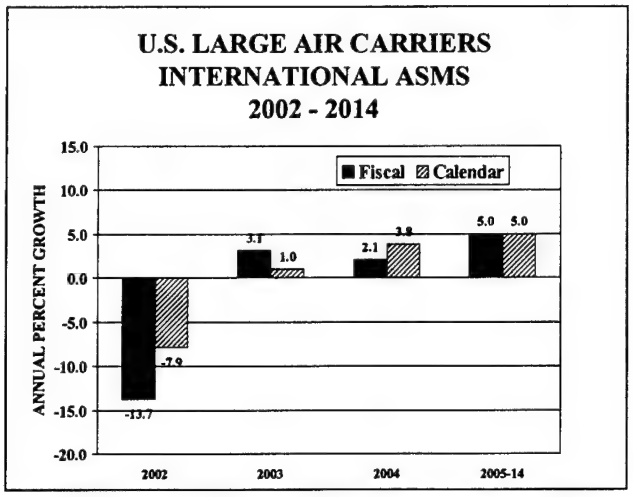
AVIATION FORECAST ASSUMPTIONS
LARGE AIR CARRIERS--PASSENGERS

FISCAL YEARS 2003-2014

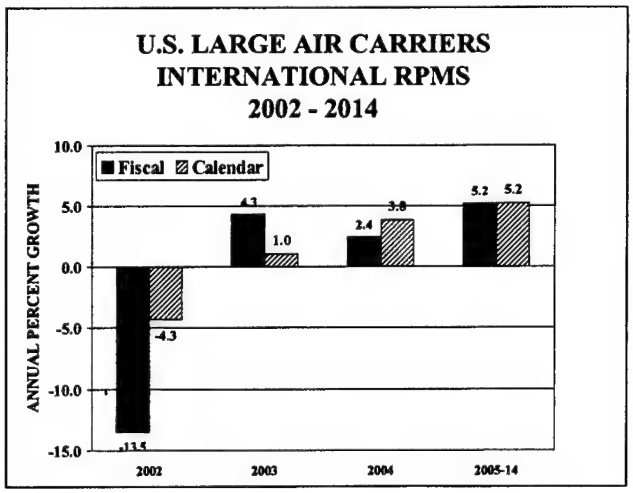
AVIATION ACTIVITY	HISTORICAL			FORECAST			PERCENT/POINT* AVERAGE ANNUAL GROWTH				
	1995	2001	2002	2003	2004	2014	95-02	01-02	02-03	03-04	02-14
Large Air Carriers											
Passenger Yields (Cents/RPM)											
(In Current Dollars)											
Domestic	13.04	13.55	11.87	12.26	12.91	14.30	(1.3)	(12.4)	3.3	5.3	1.6
International	11.14	10.38	9.76	9.98	10.10	11.86	(1.9)	(6.0)	2.3	1.2	1.6
Atlantic	9.88	9.71	9.27	9.53	9.60	11.29	(0.9)	(4.5)	2.8	0.7	1.7
Latin America	13.56	13.57	12.42	12.70	12.94	15.37	(1.2)	(8.5)	2.3	1.9	1.8
Pacific	11.55	9.38	8.67	8.79	8.89	10.09	(4.0)	(7.6)	1.4	1.1	1.3
Average Aircraft Size (Seats)											
Domestic	149.9	147.1	147.9	148.4	149.2	159.2	(0.3)	0.8	0.5	0.8	0.9
International	249.2	233.6	228.5	229.9	231.5	236.4	(3.0)	(5.1)	1.4	1.6	0.7
Atlantic	238.2	232.6	233.9	235.9	238.4	244.9	(0.6)	1.3	2.0	2.5	0.9
Latin America	184.3	174.6	172.8	173.5	174.0	179.0	(1.6)	(1.8)	0.7	0.5	0.5
Pacific	322.0	304.1	294.6	294.5	294.7	300.5	(3.9)	(9.5)	(0.1)	0.2	0.5
Average Trip Length (Miles)											
Domestic	817.6	885.5	907.5	913.6	906.0	913.8	12.8	22.0	6.0	(7.5)	0.5
International	3,026.1	3,404.8	3,278.1	3,243.8	3,263.2	3,329.7	36.0	(126.7)	(34.3)	19.4	4.3
Atlantic	3,966.1	4,211.8	4,168.7	4,176.7	4,209.6	4,332.3	28.9	(43.1)	8.0	32.9	13.6
Latin America	1,421.2	1,687.9	1,619.2	1,581.2	1,593.6	1,684.7	28.3	(68.7)	(38.0)	12.4	5.5
Pacific	3,872.4	5,228.8	5,303.7	5,278.3	5,335.8	5,361.7	204.5	74.9	(25.4)	57.5	4.8
Average Load Factor (Percent)											
Domestic	65.4	70.0	70.0	72.5	72.9	75.5	0.7	0.0	2.5	0.4	0.5
International	71.4	74.4	74.6	75.6	75.8	76.7	0.5	0.2	1.0	0.2	0.2
Atlantic	75.0	76.4	77.0	77.8	78.4	80.0	0.3	0.6	0.8	0.6	0.3
Latin America	63.1	69.2	66.5	67.9	68.8	70.0	0.5	(2.7)	1.4	0.9	0.3
Pacific	71.5	75.2	77.5	77.8	76.8	77.5	0.9	2.3	0.3	(1.0)	0.0

Source:1995-2002; U.S. Air Carriers, Form 41, U. S. Department of Transportation.
2003-2014; FAA Forecasts

* Passenger Yield, annual percent change; all other series, annual absolute change.



U.S. carriers international RPMs and enplanements declined 13.5 and 10.1 percent, respectively, in 2002. U.S. carrier RPMs are forecast to increase 4.3 percent in 2003, 2.4 percent in 2004, and 5.1 percent annually over the remainder of the forecast period. Enplanements are projected to grow 5.4 percent in 2003, 1.7 percent in 2004, and 4.9 percent yearly over the final 10 years of the forecast period, reaching 83.6 million in 2014. U.S. carrier international RPMs are expected to exceed pre-September 11th levels in 2006, enplanements in 2005.



The slower growth in U.S. carrier international traffic compared to total traffic in 2003 and 2004 reflects major route restructuring by U.S. airlines and assumes a loss of market share to foreign flag carriers. However, some of the slower growth relative to foreign flag carriers reflects a shift to more flying by foreign flag alliance partners. This shift enables U.S. carriers to continue to promote and sell travel to foreign travel destinations without incurring the costs of actually operating aircraft on these routes.

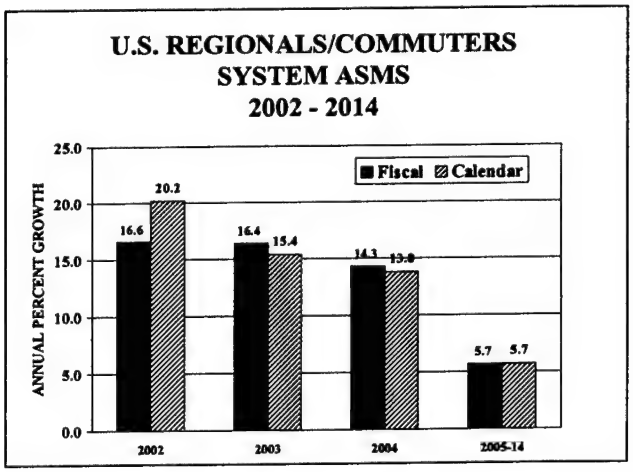
The forecasts of international demand assume that U.S. air carriers will benefit from the strong economic recovery expected to start in mid to late 2003 in both the United States and world markets. International air carrier RPMs and passenger enplanements are forecast to increase at annual rates of 4.8 and 4.7 percent, respectively, over the 12-year forecast period. The stronger growth in international travel relative to domestic markets is being driven by the strong passenger demand projected in the Latin American and Asia/Pacific markets—passengers up 5.1 and 4.7 percent, respectively.

International load factors are forecast to increase from 74.6 percent in 2002 to 75.4 percent in 2003. They will then increase gradually to 76.8 percent in 2008, and hold at or near this level throughout the rest of the forecast period.

International passenger yields were down 6.0 percent in 2002, about half the loss in domestic yields. Yields are expected to increase by 2.3 percent in 2003 and then by 1.6 percent annually over the remainder of the forecast period. In real terms, international yields decline at an annual rate of 0.6 percent over the forecast period. The decline in real yields is based on the assumption that competitive pressures will continue to exert pressure on carriers to hold the line on fare increases. In international markets, this will take the form of expanded open sky agreements and new and existing global alliances.

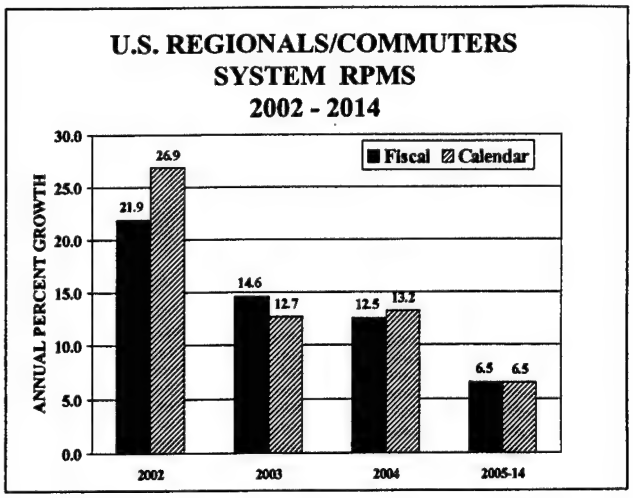
Regionals/Commuters
Capacity and Passenger Traffic

Most regionals/commuters were not only able to maintain their pre-September 11th flight schedules but were able to increase their schedules in response to the transfer of large numbers of additional routes from their larger code-share partners. Regional/ commuter ASMs were up 16.6 percent in 2002, up 17.7 percent in domestic markets but down 9.5 percent in international markets. Over the next 3-year period, regional/commuter capacity is forecast to increase at rates of 16.4, 14.3, and 10.8 percent. These relatively larger increases are due largely to the projected delivery of 705 regional jets during this period. Capacity is expected to slow to 5.3 percent annually over the remainder of the forecast period and to average 7.3 percent growth over the entire forecast period.



Regional/commuter airlines RPMs grew by 21.9 percent in 2002, up 23.1 percent in domestic markets and down 6.9 percent in international markets. RPMs are projected to increase 14.6 percent in 2003, 13.3 percent in 2004, 9.9 percent in 2005, and average 6.2 percent over the remainder of the forecast period.

Regional/commuter carriers achieved a load factor of 61.3 percent in 2002, up 2.6 percentage points over the previous year. Load factors are projected to decline gradually over the first 5 years of the forecast period, reaching 58.4 percent in 2007. However, load factors are expected to increase over the rest of the forecast period and reach 64.0 percent in 2014.



Passenger growth is expected to be less than that for RPMs, growing by 7.1 percent in 2003, 9.7 percent in 2004, and 7.0 percent in 2005. Over the 12-year forecast period, regional/commuter passengers are forecast to increase an average of 5.6 percent a year, from 90.7 million in 2002 to 174.1 million in 2014. In 2014, regionals/commuters are expected to transport 17.5 percent of all passengers in scheduled commercial air service, up from 14.5 percent in 2002.

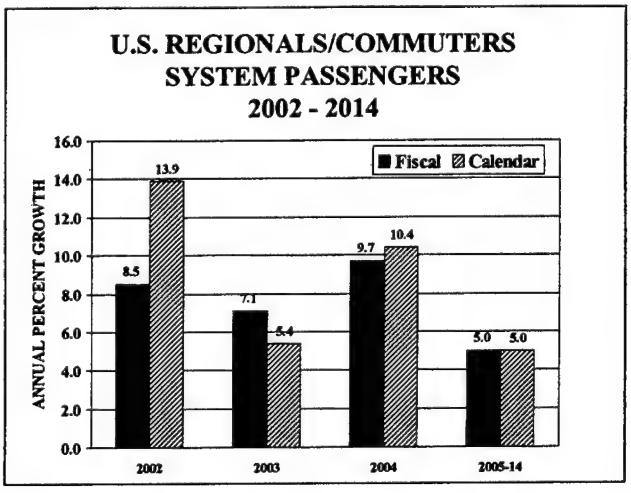


TABLE I-4

AVIATION DEMAND FORECASTS AND ASSUMPTIONS
REGIONALS/COMMUTERS

FISCAL YEARS 2003-2014

AVIATION ACTIVITY	HISTORICAL			FORECAST			PERCENT/POINT* AVERAGE ANNUAL GROWTH				
	1995	2001	2002	2003	2004	2014	95-02	01-02	02-03	03-04	02-14
REGIONAL/COMMUTERS											
Enplanements (Millions)											
Domestic	55.4	80.4	88.0	94.0	103.2	169.0	6.8	9.4	6.9	9.8	5.6
International	2.1	3.1	2.7	3.1	3.4	5.0	4.0	(13.7)	14.4	8.5	5.3
System	57.5	83.6	90.7	97.1	106.6	174.1	6.7	8.5	7.1	9.7	5.6
RPMs (Billions)											
Domestic	12.0	24.2	29.8	34.2	38.8	73.2	13.9	23.1	14.6	13.4	7.8
International	0.4	1.0	0.9	1.1	1.2	2.0	12.9	(6.9)	15.5	9.8	6.4
System	12.4	25.2	30.8	35.3	39.9	75.1	13.9	21.9	14.6	13.3	7.7
Fleet (As of December 31) 1/											
Turboprops/Pistons	2,031	1,581	1,489	1,415	1,341	1,144	(4.3)	(5.8)	(5.0)	(5.2)	(2.2)
Jets	78	782	1,032	1,289	1,538	2,890	44.6	32.0	24.9	19.3	9.0
Total	2,109	2,363	2,521	2,704	2,879	4,034	2.6	6.7	7.3	6.5	4.0
Block to Block Hours (000) 1/	4,659	5,161	5,486	5,899	6,296	9,554	2.4	6.3	7.5	6.7	4.7
Average Aircraft Size (Seats)											
Domestic	31.0	40.4	42.9	44.6	45.4	50.4	1.7	2.5	1.7	0.8	0.6
International	28.4	44.5	41.8	43.3	43.8	48.8	1.9	(2.7)	1.5	0.5	0.6
System	31.0	40.6	42.8	44.6	45.4	50.4	1.7	2.2	1.8	0.8	0.6
Average Trip Length (Miles)											
Domestic	216.0	301.4	339.1	363.5	375.5	432.9	17.6	37.7	24.4	12.0	7.8
International	193.4	319.1	344.2	347.2	351.1	389.5	21.5	25.1	3.0	3.9	3.8
System	215.2	302.1	339.2	363.0	374.7	431.6	17.7	37.1	23.8	11.7	7.7
Average Load Factor (Percent)											
Domestic	49.2	58.6	61.3	60.3	59.8	64.0	1.7	2.7	(1.0)	(0.5)	0.2
International	59.2	59.1	60.8	60.0	60.0	65.0	0.2	1.7	(0.8)	0.0	0.4
System	49.4	58.6	61.3	60.3	59.8	64.0	1.7	2.7	(1.0)	(0.5)	0.2

Source: Regionals/Commuters; 1995-2002, Forms 298-C and 41, U.S. Department of Transportation; 2003-2014, FAA Forecasts

1/ Historical and forecast data on a calendar year basis

* Enplanements, RPMs, Fleet, and Hours Flown: annual percent change: all other series, annual absolute change.

Regional/commuter aircraft operations at FAA air traffic facilities increased only 1.3 percent in 2002 despite a 16.6 percent increase in ASMs. The significantly slower growth relative to ASMs is due largely to an increase of 37.1 miles in the passenger trip length. This longer trip length is also reflected in the number of regional/commuter aircraft handled at en route centers--up 6.1 percent in 2002. This increase was due almost entirely to a 18.3 percent increase in the number of overflights, that is, flights that traverse one or more en route centers.

Regional/commuter activity is expected to increase rapidly over the next several years, averaging 3.5 percent over the next 3 years. Thereafter, regional/commuter operations are forecast to grow at an average annual rate of 2.5 percent over the rest of the forecast period. Slower growth in activity at FAA air traffic facilities relative to ASMs (2.8 versus 7.3 percent) and passengers compared to and RPMs (5.6 versus 7.7 percent) results from higher load factors and longer trip lengths.

Over the 12-year forecast, the average passenger trip length is forecast to increase from 339.2 miles in 2002 to 431.6 miles in 2014. However, much of the growth occurs during the first 3 years of the forecast period--up an average 15.0 miles a year. The relative large increases during this period result from two factors--the integration of large numbers of regional aircraft into the regional/commuter fleet and the continued transfer of nontraditional longer haul routes from their larger code-share partners. Thereafter, the passenger trip length increases by 5.0 miles annually over the rest of the forecast period.

Greater use of the larger regional jets also results in the average seating capacity of the regional fleet increasing from 42.8 seats in 2002 to 50.4 seats in 2014.

Air Cargo

Air cargo traffic on U.S. commercial air carriers declined 4.0 percent in 2002, down 5.9 percent in domestic markets and 2.2 percent in international markets. Air cargo RTMs carried by all-cargo carriers declined only 0.2 percent in 2002, down 2.8 percent in domestic markets but up 3.5 percent in international markets. Air cargo RTMs transported by passenger carriers declined 10.0 percent in 2002, down 13.6 percent in domestic markets and 8.0 percent in international markets. The greater decline in cargo carried by passenger carriers was due, in part, to the stringent security restrictions placed on the carriage of cargo on passenger aircraft after September 11th. It also reflects the large cutbacks in passenger carrier schedules in 2002.

FAA expects air cargo traffic to increase faster than passenger traffic, with system RTMs growing 5.0 percent yearly (versus 3.9 percent for RPMs) over the 12-year forecast period. Domestic RTMs are forecast to increase 3.9 percent (versus 3.6 percent) annually while international RTMs are projected to increase 5.8 percent (versus 4.9 percent) a year. The strong recovery in the global economy and increased business volumes attributable to e-commerce should stimulate the demand for the rapid movement of goods and products by air, both in domestic and international markets.

Domestic RTMs are forecast to increase 5.0 percent in 2003, 3.9 percent in 2004, and to average 3.8 percent over the final 10 years of the forecast period. Most growth in demand for domestic cargo services should occur among all-cargo carriers because of stricter security restrictions for transporting cargo on passenger aircraft and the faster growth of freight/express relative to mail. All-cargo carrier domestic RTMs are projected to increase 4.4 percent a year over the entire forecast period, compared with growth of only 2.4 percent annually for passenger carriers. All-cargo carriers' share of

TABLE I-5

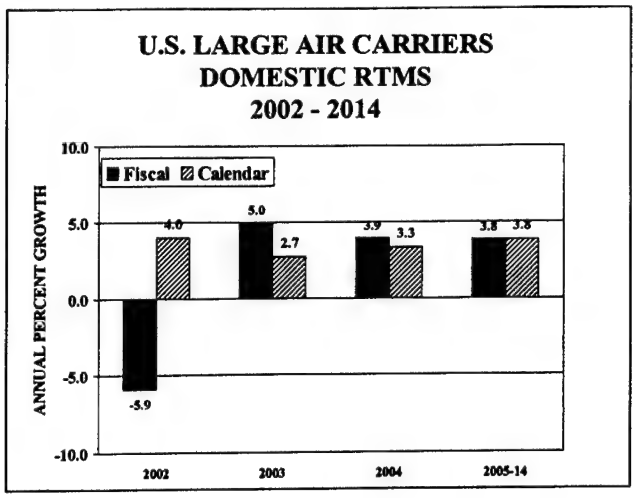
AVIATION DEMAND FORECASTS
LARGE AIR CARRIERS--AIR CARGO

FISCAL YEARS 2003-2014

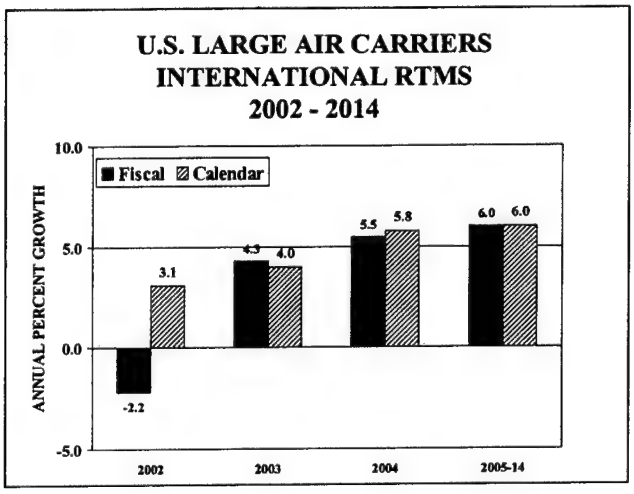
AVIATION ACTIVITY	HISTORICAL			FORECAST			PERCENT AVERAGE ANNUAL GROWTH				
	1995	2001	2002	2003	2004	2014	95-02	01-02	02-03	03-04	02-14
Total Cargo RTMs (Millions)											
Domestic	12,416	13,934	13,115	13,770	14,310	20,843	0.8	(5.9)	5.0	3.9	3.9
International	10,812	14,547	14,231	14,847	15,659	28,114	4.0	(2.2)	4.3	5.5	5.8
System	23,228	28,481	27,346	28,616	29,969	48,956	2.4	(4.0)	4.6	4.7	5.0
Total RTM's--Passenger Airlines											
Domestic	4,661	3,942	3,407	3,484	3,563	4,523	(4.4)	(13.6)	2.3	2.3	2.4
International	5,479	7,177	6,605	6,800	7,138	12,201	2.7	(8.0)	3.0	5.0	5.2
System	10,140	11,118	10,011	10,283	10,701	16,724	(0.2)	(10.0)	2.7	4.1	4.4
% RTM's--Passenger Airlines											
Domestic	37.5	28.3	26.0	25.3	24.9	21.7					
International	50.7	49.3	46.4	45.8	45.6	43.4					
System	43.7	39.0	36.6	35.9	35.7	34.2					
Total RTM's--All Cargo Airlines											
Domestic	7,754	9,992	9,708	10,286	10,747	16,320	3.3	(2.8)	5.9	4.5	4.4
International	5,333	7,370	7,627	8,047	8,521	15,912	5.2	3.5	5.5	5.9	6.3
System	13,088	17,363	17,335	18,333	19,268	32,232	4.1	(0.2)	5.8	5.1	5.3
% RTM's--All Cargo Airlines											
Domestic	62.5	71.7	74.0	74.7	75.1	78.3					
International	49.3	50.7	53.6	54.2	54.4	56.6					
System	56.3	61.0	63.4	64.1	64.3	65.8					
Cargo Aircraft 1/	824	1,039	1,034	1,052	1,082	1,547	3.3	(0.5)	1.7	2.9	3.4

Source:1995-2002; U.S. Air Carriers, Form 41, U. S. Department of Transportation.
2003-2014; FAA Forecasts
1/ Historical and forecast data on a calendar year basis

domestic RTMs is forecast to increase from 74.0 percent in 2002 to 78.3 percent in 2014.

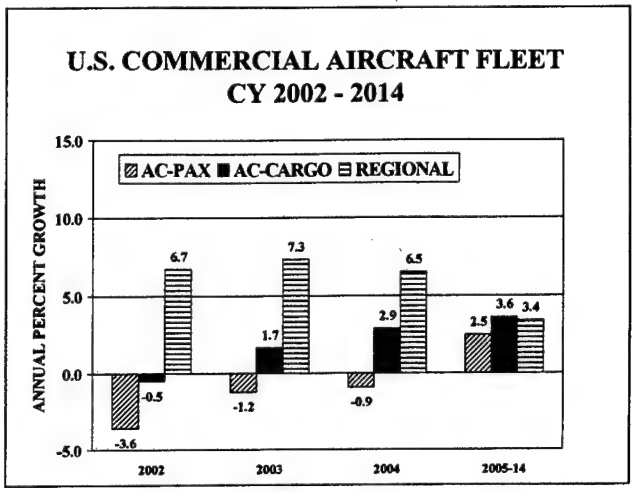


International RTMs are forecast to increase 4.3 percent in 2003 and 5.5 percent in 2004. After that, international cargo traffic is forecast to increase 6.0 percent a year over the rest of the forecast period. All-cargo and passenger carrier international RTMs are projected to increase at annual rates of 6.3 and 5.2 percent, respectively, over the 12-year forecast period. All-cargo carriers' share of international RTMs is projected to increase from 53.6 percent in 2002 to 56.6 percent in 2014.



Commercial Aircraft

The number of commercial aircraft is forecast to grow from 7,735 in 2002 to 10,842 in 2014, an average of 2.9 percent a year. Most of the growth occurs over the last 10 years of the forecast, with the fleet expected to grow only 1.9 percent in 2003 and 2.1 percent in 2004.



Over the past year, many of the larger air carriers grounded large number of their older less efficient aircraft and deferred delivery of new aircraft scheduled for delivery over the next several years. As such, the number of large passenger jets (over 70 seats) declined by 155 aircraft in 2002 and are expected to decline by an additional 51 aircraft in 2003 and 36 aircraft in 2004. Over the remaining 10 years of the forecast period, the large air carrier passenger fleet increases by an average of 90 aircraft a year, reaching a total of 5,261 aircraft in 2014. The narrowbody fleet is projected to grow by 75 aircraft annually over the 12-year forecast period, the widebody fleet by only 15 aircraft a year.

The regional/commuter passenger fleet is forecast to increase at an average annual rate of 4.0 percent over the forecast period, from 2,521 in 2002 to 4,034 aircraft in 2014. The number of regional jets (up to 70 seats) in regional/ commuter service is projected to grow from 976 in 2002 to 2,834 in 2014, an average annual increase of 9.3 percent. However, the

turboprop/piston fleet is expected to decline from 1,489 in 2002 to 1,144 in 2014. Turboprop/piston aircraft are expected to account for only 28.4 percent of the regional fleet in 2014, down from a 59.1 percent share in 2002.

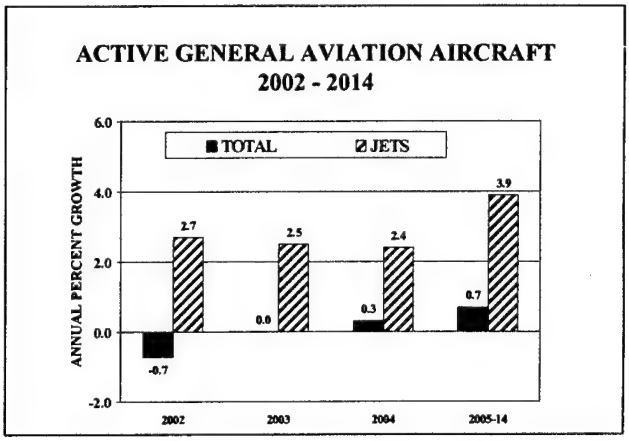
Cargo large jet aircraft are forecast to increase from 1,034 in 2002 to 1,547 in 2014, an average increase of 3.4 percent (43 aircraft) a year. The narrowbody jet fleet is projected to decline by 38 aircraft over the 12-year forecast period. The widebody jet fleet is projected to increase by 46 aircraft yearly.

General Aviation

After September 11th, thousands of general aviation aircraft were grounded for weeks by FAA "no-fly zone" restrictions imposed on the operation of aircraft in security sensitive areas around the country, effectively closing much of the airspace to VFR traffic. In addition, many flight schools curtailed pilot training as new restrictions were imposed on the training of pilots from foreign countries. Even 15 months later, some airspace and airports in and around Washington, DC and New York City remain closed to VFR traffic, including Washington National Airport. These security restrictions did impact the general aviation community but not to the extent that it would have prior to the passage of the General Aviation Revitalization Act of 1994.

The current forecast assumes that business use of general aviation aircraft will expand at a more rapid pace than that for personal/sport use. The business/corporate side of general aviation should continue to benefit from the security restrictions imposed on flying by commercial aircraft. Safety concerns for corporate staff, combined with increased check-in and security clearance times at many U.S. airports, have made fractional and corporate aircraft ownership as well as on-demand charter flights viable alternatives to travel on commercial flights.

The active general aviation fleet is projected to increase at an average annual rate of 0.7 percent over the 12-year forecast period, growing from an estimated 211,040 in 2002 to 229,490 aircraft in 2014. The more expensive and sophisticated turbine-powered fleet (including rotorcraft) is projected to grow at an average annual rate of 2.3 percent over the 12-year forecast period. However, the jet fleet is responsible for most of this growth, increasing from 8,000 in 2002 to 12,300 in 2014, an average annual increase of 3.6 percent.



At the September 2002 TRB/FAA workshop, the Business Aviation Panel suggested that the market for the new Eclipse jet aircraft could add an additional 5,000 aircraft to the active fleet by 2010. The Eclipse, a relatively inexpensive (priced at under $1 million) twin-engine business aircraft, is believed to have the potential to redefine the business jet segment by expanding business jet flying and offering performance that may support true air-taxi business service. However, because it has not yet received certification, the forecasts do not include the entry of this or similar type aircraft into the fleet.

The number of piston powered aircraft (including rotorcraft) are projected to increase from 165,190 in 2002 to 170,210 in 2014, an average increase of only 0.2 percent annually.

TABLE I-6

AVIATION DEMAND FORECASTS AND ASSUMPTIONS
GENERAL AVIATION

CALENDAR YEARS 2003-2014

AVIATION ACTIVITY	HISTORICAL			FORECAST			PERCENT AVERAGE ANNUAL GROWTH				
	1995	2001	2002	2003	2004	2014	95-02	01-02	02-03	03-04	02-14
GENERAL AVIATION											
Active Fleet (000)	188.1	211.4	211.0	211.4	213.1	229.5	1.7	(0.2)	0.2	0.8	0.7
Pistons	152.8	163.3	162.7	162.8	163.1	167.4	0.9	(0.4)	0.0	0.2	0.2
Single Engine	137.0	145.0	144.5	144.6	144.9	149.6	0.8	(0.4)	0.0	0.2	0.3
Multi-Engine	15.7	18.3	18.2	18.2	18.2	17.8	2.1	(0.2)	(0.2)	(0.2)	(0.2)
Turbine	9.6	14.4	14.6	14.9	15.2	20.3	6.2	1.5	2.0	2.1	2.8
Turboprops	5.0	6.6	6.6	6.7	6.8	8.0	4.1	0.1	1.4	1.8	1.6
Turbojets	4.6	7.8	8.0	8.2	8.4	12.3	8.4	2.7	2.5	2.4	3.6
Rotorcraft	5.8	6.8	6.8	6.8	6.9	7.4	2.2	0.3	0.3	0.7	0.7
Experimental	15.2	20.4	20.4	20.4	20.5	21.5	4.3	(0.1)	0.0	0.2	0.4
Sport Aircraft	NA	NA	NA	NA	1.0	6.2	NA	NA	NA	NA	NA
Other	4.7	6.5	6.5	6.5	6.5	6.7	4.6	(0.7)	0.0	0.3	0.3
Hours Flown (Millions)	26.6	29.1	29.5	29.8	30.2	35.3	1.5	1.1	1.2	1.4	1.5
Pistons	20.3	20.9	20.9	21.0	21.1	22.3	0.5	0.1	0.4	0.5	0.5
Single Engine	17.8	17.9	17.9	18.0	18.1	19.4	0.1	0.1	0.4	0.6	0.6
Multi-Engine	2.4	3.0	3.0	3.0	3.0	2.9	3.0	(0.1)	0.0	(0.2)	(0.1)
Turbine	2.9	4.6	4.9	5.1	5.3	8.3	7.5	7.2	5.0	3.3	4.5
Turboprops	1.5	1.9	2.0	2.1	2.1	2.3	4.4	5.1	5.0	0.9	1.1
Turbojets	1.5	2.7	2.9	3.0	3.2	6.0	10.3	8.7	5.0	4.9	6.2
Rotorcraft	2.0	2.1	2.1	2.1	2.2	2.4	1.1	(1.5)	0.7	1.2	1.2
Experimental	1.2	1.2	1.2	1.2	1.2	1.3	0.1	(1.2)	0.0	0.8	0.7
Sport Aircraft	NA	NA	NA	NA	0.1	0.6	NA	NA	NA	NA	NA
Other	0.3	0.3	0.3	0.3	0.4	0.4	4.1	6.5	0.0	1.4	1.1
Aircraft Utilization (Hours)	141.5	137.8	139.6	141.0	141.7	153.8	(0.2)	1.3	1.0	0.5	0.8
Pistons	132.5	127.9	128.4	128.9	129.3	133.2	(0.4)	0.4	0.4	0.3	0.3
Turbine	308.2	317.8	335.6	345.5	349.4	407.2	1.2	5.6	3.0	1.1	1.6
Rotorcraft	336.4	315.8	310.3	311.6	313.0	330.9	(1.1)	(1.7)	0.4	0.4	0.5
Total Active Pilots (000)	639.2	657.5	661.4	664.8	670.9	777.7	0.5	0.6	0.5	0.9	1.4
Instrument Rated Pilots (000)	298.8	321.0	317.4	319.6	323.5	385.9	0.9	(1.1)	0.7	1.2	1.6

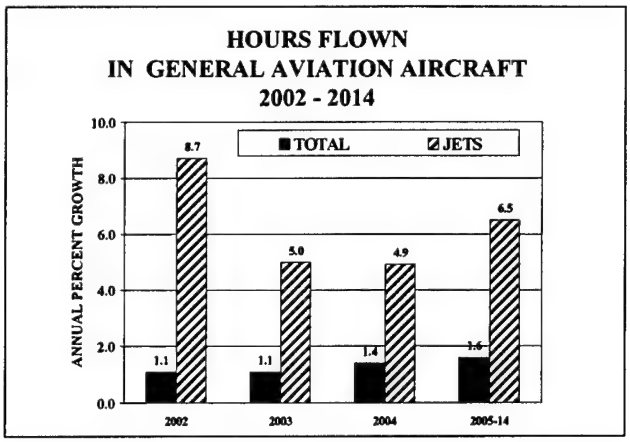
Source: Fleet and Hours; 1995-2001, FAA General Aviation and Air Taxi Activity Survey; 2002-2014, FAA Forecasts
Pilots; 1995-2002, FAA Aeronautical Center; 2003-2014, FAA Forecasts

This slow growth is due, in part, to declining numbers of multi-engine aircraft, which decline at an average rate of 0.2 percent over the forecast period. Single engine pistons and piston rotorcraft increase at annual rates of 0.3 and 1.1 percent, respectively, during the 12-year forecast period.

In 2004, owners could register approximately 2,000 existing ultralights not currently included in the FAA's aircraft registry counts, as "light sport" aircraft. The forecast assumes registration of these aircraft over a 2-year period beginning in 2004. In addition, it is projected that approximately 300-500 newly manufactured light sport aircraft will enter the active fleet on an annual basis beginning in 2005. This new aircraft category is expected to total 6,200 by 2014.

The number of general aviation hours flown is projected to increase by only 1.1 percent in 2003 and 1.4 percent in 2004, largely the result of the lingering effects of a sluggish U.S. economy and the events of September 11th. However, hours flown are expected to increase 1.6 percent a year over the last 10 years of the forecast period. Much of the increase over this latter period reflects increased flying by business and corporate aircraft as well as increased utilization rates on other general aviation aircraft.

Hours flown by turbine aircraft (including rotorcraft) increase an average of 3.7 percent yearly over the forecast period, compared with only 0.6 percent for piston powered aircraft. Jet aircraft account for most of the increase, expanding at an average annual rate of 6.2 percent. The large increases in jet hours are due to the expected increases in the fractional ownership fleet and its activity levels. Fractional ownership aircraft average approximately 1,200 hours annually compared to only 360 hours for all business jets.



The number of active general aviation pilots (excluding air transport pilots) are projected to total 595,130 in 2014, an increase of almost 81,000 (up 1.2 percent annually) over the forecast period. A large part of the expected growth (55,000 pilots, 68.0 percent) is projected to occur in the private and commercial categories, reflecting the expected increase in the demand for pilots among fractional ownership companies and business corporations. The number of private pilots are projected to total 290,550 (up 0.9 percent annually) in 2014. Commercial pilots are forecast to increase from 137,504 in 2002 to 162,600 in 2014, an average annual increase of 1.4 percent.

The number of student pilots is projected to increase by only 1.0 percent in 2003, reflecting sluggish U.S. economic activity and the lingering uncertainties surrounding restrictions imposed on flight school and pilot training. However, growth picks up in 2004 and averages 2.1 percent over the entire forecast period. Almost 25,000 new student pilots are projected to be certified during the 12-year forecast period.

FAA Workload Forecasts

There were 483 towered airports at the end of September 2002, 266 FAA towers and 217 contract towers. While the number of FAA towers will remain constant at 266 in 2003,

FAA expects the number of FAA contract towered airports to increase by 7 to 224. In 2002, aircraft activity at these seven airports totaled approximately 791,000 operations, with general aviation accounting for 94.2 percent of the total activity.

Table I-7 (page I-31) provides summary forecasts of aircraft activity at combined tower facilities. Table I-8 (page I-32) gives summary forecasts of activity at FAA facilities only, including FAA towers, en route centers, and flight service stations. Chapter VII and Tables 34 through 51 in Chapter X give more detailed forecasts and discussion of aircraft activity at FAA and contract facilities.

Table I-9 (page I-34) provides summary forecasts on a calendar year basis for activity at en route centers.

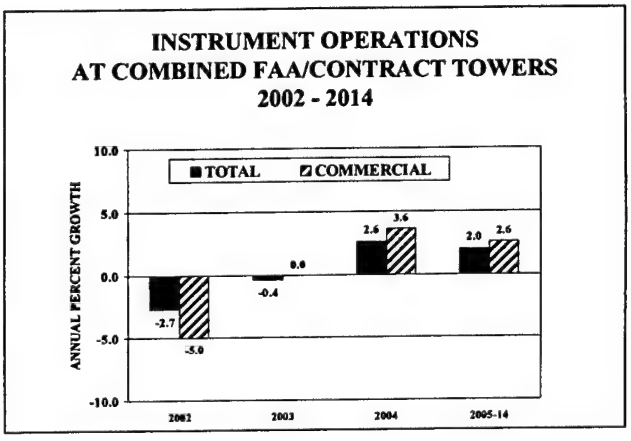
FAA and Contract Towers

Activity at the combined FAA and contract towers totaled 64.9 million operations in 2002, a decline of 2.0 percent from 2001. Activity is expected to increase remain flat in 2003, largely the result of a decline of 2.0 percent in air carrier activity. Activity is expected to rebound sharply beginning in 2004, increasing by 2.6 percent in 2004 and 2.0 percent in 2005. Activity at combined FAA/contract towers is projected to increase at an average annual rate of 1.7 percent over the remaining 9 years of the forecast period, reaching 79.1 million operations in 2014. A large part of the growth after 2005 is the result of increased commercial aircraft activity (up 2.5 percent annually). Activity at combined FAA/contract towers are expected to return to pre-September 11th levels in 2005/06.

General aviation activity is forecast to remain constant in 2003, reflecting decreased activity levels that began last March (down 5.1 percent March - August). After that, general aviation activity increases at an average annual rate of 1.4 percent over the remainder of the forecast period, reaching 43.6 million operations in 2014. General aviation activity would have declined in 2003 without the addition of the seven new contract towers.

Military activity, which increased 5.0 percent in 2002, is expected to increase by 0.4 percent in both 2003 and 2004, the increased activity due to the seven new contract towers. Military activity is held constant at the 2004 activity level throughout the remainder of the forecast period.

Combined instrument operations counts at FAA and contract towered airports declined by 2.7 percent in 2002. Instrument activity is expected to decline 0.4 percent in 2003, then increase by 2.6 percent in 2004 and 2.5 percent in 2005. Thereafter, instrument operations increase at an average annual rate of 2.0 percent over the remainder of the forecast period, totaling 61.9 million operations in 2014. Instrument activity at combined FAA/contract towers are expected to return to pre-September 11th levels in 2006.



Commercial aircraft instrument operations are forecast to increase at significantly faster rates than are general aviation instrument operations, up 2.5 versus 1.4 percent over the forecast period. Much of the increase in commercial activity is due to strong growth by commuter/air taxis--up 2.8 percent annually compared to 2.2 percent for the air carrier segment. Military activity is expected to remain constant at its

TABLE I-7

AVIATION ACTIVITY FORECASTS
COMBINED FAA AND CONTRACT TOWERS

FISCAL YEARS 2003-2014

ACTIVITY MEASURES (In Millions)	HISTORICAL			FORECAST			PERCENT AVERAGE ANNUAL GROWTH				
	1995	2001	2002	2003	2004	2014	95-02	01-02	02-03	03-04	02-14
NUMBER OF TOWERS											
FAA Towers	326	266	266	266	266	266					
FAA Contract Towers	95	206	217	224	224	224					
TOTAL	421	472	483	490	490	490					
AIRCRAFT OPERATIONS											
Air Carrier	13.6	14.8	13.2	12.9	13.4	17.1	(0.5)	(10.5)	(2.0)	3.3	2.2
Commuter/Air Taxi	10.2	10.9	11.0	11.3	11.8	15.3	1.1	1.4	2.5	4.0	2.8
General Aviation	35.9	37.6	37.6	37.6	38.3	43.6	0.6	(0.1)	(0.0)	2.1	1.3
Itinerant GA	20.9	21.4	21.4	21.4	21.8	24.9	0.4	(0.1)	(0.3)	2.1	1.3
Local GA	15.1	16.2	16.2	16.2	16.5	18.7	1.0	(0.2)	0.3	2.0	1.2
Military	2.6	2.9	3.1	3.1	3.1	3.1	2.3	5.0	0.4	0.4	0.1
Itinerant MIL	1.3	1.5	1.6	1.6	1.6	1.6	2.2	4.8	0.8	0.7	0.1
Local MIL	1.3	1.4	1.5	1.5	1.5	1.5	2.4	5.1	0.0	0.0	0.0
TOTAL	62.4	66.2	64.9	64.9	66.5	79.1	0.6	(2.0)	0.0	2.6	1.7
INSTRUMENT OPERATIONS											
Air Carrier	14.7	16.0	14.4	14.1	14.5	18.7	(0.3)	(10.0)	(2.0)	3.3	2.2
Commuter/Air Taxi	11.0	11.7	11.9	12.2	12.7	16.6	1.2	1.7	2.5	4.0	2.8
General Aviation	18.2	19.7	19.7	19.4	19.8	23.1	1.1	(0.2)	(1.1)	1.7	1.4
Military	3.6	3.5	3.6	3.6	3.6	3.6	0.1	1.8	0.0	0.0	0.0
TOTAL	47.4	50.9	49.6	49.3	50.6	61.9	0.6	(2.7)	(0.4)	2.6	1.9

Source: FY 1995-2014, FAA Data and Forecasts

TABLE I-8

AVIATION ACTIVITY FORECASTS
FAA FACILITIES

FISCAL YEARS 2003-2014

ACTIVITY FORECASTS (In Millions)	HISTORICAL			FORECAST			PERCENT AVERAGE ANNUAL GROWTH				
	1995	2001	2002	2003	2004	2014	95-02	01-02	02-03	03-04	02-14
AIRCRAFT OPERATIONS											
Air Carrier	13.6	14.5	13.0	12.7	13.2	16.9	(0.6)	(10.6)	(2.0)	3.3	2.2
Commuter/Air Taxi	9.8	9.3	9.5	9.7	10.1	13.1	(0.5)	1.8	2.5	4.0	2.8
General Aviation	32.3	24.8	24.1	23.8	24.1	27.4	(4.1)	(2.9)	(1.1)	1.1	1.1
Itinerant GA	18.9	14.9	14.5	14.4	14.6	16.7	(3.7)	(2.7)	(1.2)	1.3	1.1
Local GA	13.4	9.8	9.5	9.4	9.5	10.7	(4.7)	(3.1)	(1.0)	0.7	1.0
Military	2.3	2.0	2.0	2.0	2.0	2.0	(1.9)	0.7	0.0	0.0	0.0
Itinerant MIL	1.2	1.1	1.1	1.1	1.1	1.1	(1.1)	1.0	0.0	0.0	0.0
Local MIL	1.1	0.9	0.9	0.9	0.9	0.9	(2.7)	0.4	0.0	0.0	0.0
TOTAL	58.0	50.6	48.5	48.3	49.3	59.4	(2.5)	(4.1)	(0.6)	2.2	1.7
INSTRUMENT OPERATIONS											
Air Carrier	14.6	15.9	14.3	14.0	14.4	18.5	(0.4)	(10.1)	(2.0)	3.3	2.2
Commuter/Air Taxi	10.8	11.4	11.6	11.9	12.3	16.1	1.0	2.0	2.5	4.0	2.8
General Aviation	18.1	19.4	19.4	19.2	19.5	22.8	1.0	(0.2)	(1.1)	1.7	1.4
Military	3.5	3.5	3.5	3.5	3.5	3.5	(0.1)	1.8	0.0	0.0	0.0
TOTAL	47.0	50.1	48.7	48.5	49.8	60.9	0.5	(2.7)	(0.4)	2.6	1.9
IFR AIRCRAFT HANDLED											
Air Carrier	21.0	24.9	22.8	22.4	23.1	29.6	1.2	(8.2)	(2.1)	3.3	2.2
Commuter/Air Taxi	6.9	8.3	8.8	9.0	9.4	12.3	3.5	6.1	2.7	4.1	2.8
General Aviation	7.8	8.0	8.2	8.3	8.4	9.8	0.6	1.9	1.0	1.7	1.6
Military	4.4	4.0	3.9	3.9	3.9	3.9	(1.6)	(2.9)	0.0	0.0	0.0
TOTAL	40.1	45.2	43.7	43.6	44.8	55.6	1.2	(3.3)	(0.3)	2.9	2.0
FLIGHT SERVICES											
Pilot Briefs	9.2	7.4	7.5	7.3	7.3	7.2	(2.9)	0.5	(1.8)	(0.2)	(0.3)
Flight Plans Originated	6.3	5.7	5.8	5.6	5.6	5.8	(1.3)	0.4	(2.4)	(0.5)	(0.0)
Aircraft Contacted	4.2	3.0	3.0	3.0	3.0	2.7	(4.9)	0.3	0.3	(0.6)	(0.8)
TOTAL	35.2	29.3	29.4	28.9	28.8	28.6	(2.5)	0.4	(1.8)	(0.3)	(0.3)
DUATS	11.5	15.9	16.5	16.4	16.8	19.6	5.3	3.4	(0.6)	2.6	1.5
TOTAL (w/DUATS)	46.7	45.2	45.9	45.3	45.6	48.2	(0.3)	1.5	(1.4)	0.7	0.4

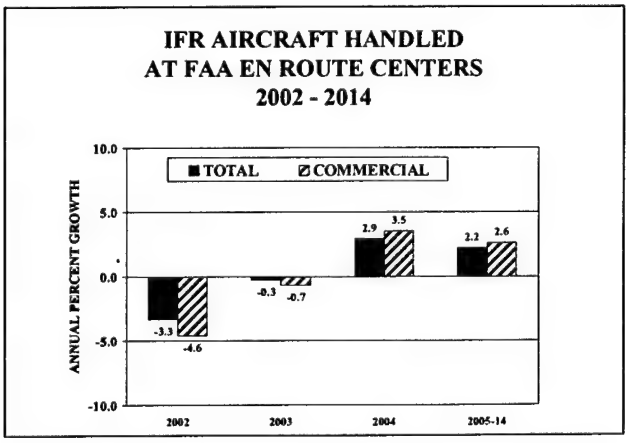
Source: FY 1995-2014, FAA Data and Forecasts

2002 level of activity throughout the forecast period.

En Route Centers

The workload at FAA en route traffic control centers declined by 3.3 percent in 2002, largely due to declines in air carrier and military activity--down 8.2 and 2.9 percent, respectively. Commuter/air taxi and general aviation activity were up 6.1 and 1.9 percent, respectively. The number of aircraft handled at en route centers is forecast to decline by 0.3 percent in 2003, largely the result of a 2.1 percent decline in air carrier activity. En route traffic activity then grows by 2.9 percent in 2004, 2.7 percent in 2005, and averages 2.1 percent over the rest of the forecast period, reaching a total of 55.6 million aircraft handled in 2014. Activity at FAA en route centers is expected to recover to pre-September 11th levels in 2005.

The number of commercial aircraft handled is projected to increase 2.4 percent annually while general aviation en route activity increases 1.6 percent a year over the 12-year forecast period. Military activity is held constant at the 2002 activity level throughout the forecast period.



The higher growth rate at FAA en route centers, relative to activity at combined towered airports (2.0 versus 1.7 percent), reflects that commercial activity accounts for a much larger percentage of center activity—72.3 versus 37.4 percent at towered airports in 2002. Therefore, the projected larger increases in commercial aircraft activity have a much greater impact on total center traffic during the forecast period.

Flight Service Stations

Total flight services originating at traditional FAA flight service stations (non-automated) were up 0.4 percent in 2002, the first recorded increase since 1989. However, most of this growth occurred during the first quarter of 2002, when IFR and VFR flight plans were up 18.3 and 11.5 percent, respectively. These large increases were due, in part, to restrictions placed on VFR flying after the September 11th terrorist attacks.

Flight services are forecast to decline 1.8 percent in 2003 and then decline gradually (0.1 percent annually) over the remaining 11 years of the forecast period, totaling 28.6 million flight services in 2014. The number of flight plans originated is expected to decline over the first 3 years of the forecast period, then increase at an annual rate of 0.4 percent over the rest of the forecast period. In 2014, the number of flight plans originated totals almost 5.8 million, essentially the same activity level recorded in 2002. The number of pilot briefs (down 0.3 percent annually) and aircraft contacted (down 0.8 percent annually) decline throughout the entire 12-year forecast period, totaling 7.2 and 2.7 million, respectively in 2014.

The number of DUATS services are projected to grow at an average annual rate of 1.5 percent over the forecast period, from 16.5 million in 2002 to 19.6 million in 2014. Combined FSS and DUATS services are expected to total 48.2 million in 2014, an annual increase of 0.5 percent.

TABLE I-9

FAA AVIATION FORECASTS
SELECTED AVIATION DEMAND MEASURES

CALENDAR YEAR 2003-2014

SELECTED FORECASTS (In Millions)	HISTORICAL			FORECAST			PERCENT AVERAGE ANNUAL GROWTH				
	1995	2001	2002	2003	2004	2014	95-02	01-02	02-03	03-04	02-14
U.S. Economy											
GDP (Bil 1996$)	7,543.8	9,214.6	9,439.8	9,709.5	10,060.7	13,747.3	3.3	2.4	2.9	3.6	3.2
Oil & Gas Deflator (1996 = 100)	94.2	116.8	107.4	99.1	95.3	113.0	1.9	(8.1)	(7.7)	(3.8)	0.4
U.S. Air Carrier Enplanements (Mil)											
Domestic	474.9	520.6	491.5	502.7	522.7	739.3	0.5	(5.6)	2.3	4.0	3.5
International	47.8	50.5	49.6	50.7	52.4	84.9	0.5	(1.7)	2.1	3.4	4.6
Atlantic	16.1	19.1	18.6	18.8	19.3	30.2	2.0	(2.9)	1.1	2.9	4.2
Latin America	17.0	20.9	21.5	22.4	23.4	38.8	3.4	2.6	4.3	4.3	5.0
Pacific	14.6	10.4	9.6	9.5	9.7	15.9	(5.9)	(8.1)	(0.8)	1.9	4.3
System	522.7	571.1	541.1	553.4	575.1	824.2	0.5	(5.3)	2.3	3.9	3.6
U.S. Air Carrier RPMs (Bil)											
Domestic	389.4	463.5	449.3	461.4	475.9	678.8	2.1	(3.1)	2.7	3.1	3.5
International	145.7	170.6	163.2	164.9	171.1	282.9	1.6	(4.3)	1.0	3.8	4.7
Atlantic	64.5	80.4	77.4	78.5	81.6	131.6	2.6	(3.8)	1.4	4.1	4.5
Latin America	24.5	35.2	34.6	35.6	37.3	65.3	5.1	(1.8)	2.8	4.8	5.4
Pacific	56.7	54.9	51.3	50.9	52.2	86.1	(1.4)	(6.7)	(0.7)	2.6	4.4
System	535.1	634.1	612.6	626.3	647.0	961.7	1.9	(3.4)	2.2	3.3	3.8
Reginals/Commuters											
Enplanements (Mil)	58.4	82.4	93.8	99.0	109.2	178.4	7.0	13.9	5.5	10.3	5.5
RPMs Bil)	12.7	25.5	32.3	36.5	41.3	77.6	14.3	26.9	12.9	13.2	7.6
Air Cargo RTM's (Bil)											
Domestic	12.5	13.1	13.6	14.0	14.4	21.0	1.2	4.0	2.7	3.3	3.7
International	10.8	14.0	14.5	15.1	15.9	28.6	4.3	3.1	4.0	5.8	5.8
System	23.3	27.1	28.1	29.0	30.4	49.6	2.7	3.5	3.4	4.6	4.9
IFR Aircraft Handled (Mil)											
Commercial	27.9	32.4	32.0	31.7	32.8	42.2	2.0	(1.2)	(1.1)	3.4	2.3
Non-Commercial	12.1	12.0	12.1	12.2	12.4	13.8	(0.0)	0.9	1.0	1.2	1.1
Total Aircraft Handled	40.1	44.4	44.1	43.9	45.1	56.0	1.4	(0.7)	(0.5)	2.8	2.0

Source: CY 1995-2002, Economic data, OMB; Air Carrier/Regional data, DOT; FAA Workload, FAA.
CY 2003-2014, FAA Forecasts

FORECAST RISKS

The risks inherent in this year's forecasts are largely on the downside. Prominent in everyone's predictions of future aviation demand is the assumption that there will not be another terrorist incident aimed at U.S. aviation. Yet aviation, because of its high visibility and global reach, has been and will continue to be a target for international terrorism. However, the implementation of tighter security measures has, to a large extent, restored the public's confidence in the integrity of our aviation security systems.

Unfortunately, the heightened security measures and procedures have also significantly increased the processing times required for check-in and security clearance. And with new luggage screening security measures, airport processing times and delays could become longer. The increased airport processing times and "hassle factor" may have caused some business travelers to switch to alternative modes of transportation in 2002, particularly on short-haul routes of up to 200-400 miles. Similar diversions from air travel are likely to continue over the next several years. However, it is assumed that airport processing times will, over time, fall to what the traveling public perceives as more reasonable levels.

A possible war with Iraq provides one of the greatest risks to achieving the forecasts contained herein. The U.S. commercial aviation industry was impacted significantly after Iraq invaded Kuwait on August 2, 1990. On August 17, the Civil Reserve Air Fleet (CRAF) program activated approximately 50 U.S. air carrier aircraft. The price of jet fuel doubled from $0.57 a gallon in July to $1.14 a gallon in October and U.S. commercial carriers reported operating losses of nearly $3.8 billion during the 1st half of FY 1991. Also during the first 6 months of FY 1991, domestic enplanements declined 3.1 percent and passengers on North Atlantic routes declined 28.0 percent. Additionally, Continental and America West filed for Chapter 11 bankruptcy and Eastern, Midway, and Pan American ceased operations. The U.S. commercial aviation industry can ill afford similar impacts in 2003.

Since the events of September 11th, Midway, National, Sun Country, United, US Airways, and Vanguard have filed for Chapter 11 or Chapter 7 bankruptcy. All but United and US Airways have ceased flying. Twenty-five percent of U.S. large air carrier capacity is now operating under Chapter 11 bankruptcy. Competing carriers may have to either seek bankruptcy or risk confrontations with its unions to match the lowered costs of a restructured United or US Airways. This scenario could lead to more contractions in aviation services, mainly to small and medium sized communities. The demand for aviation services would also be significantly impacted under such a scenario.

The commercial industry's current financial condition, combined with the uncertainty of other large carrier's response to the United and U.S. Airways bankruptcies, could conceivably result in a major consolidation of the industry over the next several years. While consolidation may improve the financial health of individual carriers and the industry, the fear is that consolidation could lessen competition in many markets. Less competition could mean higher fares to the flying public and lower travel demand.

Over the past several years, the gap between what a traveler pays and the revenue that airlines receive has widened due to increases in the amount of taxes and fees added to the ticket price. It is now being debated as to who should bear the cost of increased security--the passenger, the airline, or the Government. If the cost of added security is passed on to the consumer or airlines, it would not only result in a significant increase in costs to both consumers and airlines, but it could also reduce demand at the same time.

The economic forecasts used to develop this year's aviation forecasts assume a very strong recovery starting in mid-to-late 2003. Yet, the U.S. economy continues to experience depressed equity values and scandals surrounding business accounting practices, both of which could slow the recovery. Slower economic growth would not only slow the recovery in the demand for aviation services but would also slow the industry's return to profitability. The latest Global Insight economic forecasts project a 30 percent probability of the U.S. economy entering a "double-dip" recession in 2003.[18]

Internationally, the Japanese economy, currently in recession (GDP down 0.2 percent in 2002), continues to send mixed signals and a prolonged recession or continued slow growth could negatively impact the entire region. Argentina's current financial and political crises, (GDP down 12.2 percent in 2002) has spread to other regional economies, most notably Venezuela (down 6.7 percent) and Uruguay (down 8.8 percent), and could worsen and spread to additional countries. Also, if the economic recovery in the U.S. is less than forecast, this could also negatively impact countries whose economies are dependent on export trade with the United States. The current forecasts assume strong passenger growth for travel between the United States and other world regions. Any slowing of demand could seriously inhibit the growth in world passenger demand.

The general aviation industry appears to have weathered both the events of September 11th as well as the economic recession. However, demand for general aviation products and services, including business jets, was down in 2002. How quickly the industry recovers depends, in large part, on a strong recovery in the market for business jets. However, some financial analysts are predicting that the business jet industry is at the beginning of what could be a multiyear cyclical downturn. This, combined with still unresolved security restrictions, could significantly lower the demand for both business and corporate aircraft and services.

Unresolved security restrictions also could constrain growth in personal flying for years to come. Regardless of any new restrictions, how quickly this flying segment responds to the economic rebound will go a long way in determining whether general aviation achieves our predicted increases in the demand for its products and services.

The current forecasts assume that commercial activity (air carrier and regionals/commuters) return to pre-September levels in 2005/2006. Therefore, delays could become a critical limit to growth within this forecast period. How Government and industry planners use the next several years to develop comprehensive plans to head off certain future delays will be critical to fulfilling this forecast.

Also, reduced levels of total demand at FAA facilities do not necessarily imply reduced workload for FAA air traffic controllers. Most large air carrier schedule reductions at large hub airports occurred during off-peak periods. At some airports, peak period activity levels may have increased over pre-September 11th levels. In addition, the mix of aircraft now operating at most large hubs is significantly more complex than before September 11th. Smaller regional jets that require greater separation than the larger aircraft they replaced will operate a greater proportion of flights now and in the future. These complexities will make the FAA job more challenging even with less overall traffic.

The economic scenarios presented in this document call for a strong recovery beginning in the latter half of 2003 and sustained moderate growth for both the U.S. and world economies. If these economic forecasts are realized, the

[18] *U.S. Economic Outlook*, Global Insight, Inc., December 2002

demand for commercial and general aviation products and services should fully recover from the twin effects of the 2001 economic recession and events of September 11th by 2005. Demand should also continue to expand throughout the rest of the forecast period.

FORECAST SUMMARY

Highlights of the current FAA aviation forecasts for the 2003 - 2014 time period include:

- The U.S. and world economies recover strongly from the current recession in mid to late 2003 and achieve moderate sustained growth through 2014. The U.S. economy is expected to grow only slightly less than that of worldwide economic activity (3.2 versus 3.3 percent annually). Most of world economic growth is expected to take place in the Latin American (4.0 percent annually) and Asia/Pacific (3.6 percent annually) regions.

- Both U.S. large carrier domestic and international passenger traffic is expected to achieve positive growth in 2003, with international markets forecast to grow significantly faster than domestic markets (4.7 versus 3.5 percent annually) over the 12-year forecast period. Most of the growth in international travel over this is expected to occur in Latin American and Asia/Pacific markets, up 5.1 and 4.7 percent, respectively.

- Regional/commuter passenger traffic will continue to grow at a faster rate than their larger domestic counterparts (5.6 versus 3.5 percent annually) over the forecast period. Stronger growth results from additional route transfers from their larger code-share partners as well as from the establishment of nontraditional point-to-point using the new regional jets.

- Air cargo traffic is expected to grow at rates higher than those predicted for passenger traffic, with domestic and international RTMs increasing at annual rates of 3.9 and 5.8 percent, respectively, over the forecast period.

- General aviation is expected to achieve low to moderate increases in its active fleet (0.7 percent annually) and hours flown (1.5 percent annually), with most of the growth occurring in business and corporate flying.

- Combined aviation activity at FAA and contract facilities is expected to grow at annual rates of 1.7 percent annually over the 12-year forecast period, with commercial activity (up 2.5 percent annually) increasing at significant higher rates than those predicted for general aviation (1.3 percent annually).

The major uncertainties that have the potential to impact the demand for U.S. and international aviation services include:

- A possible war with Iraq provides one of the greatest risks to achieving the aviation forecasts. For some period of time, it would reduce passenger demand as well as drive operating costs higher. In its current financial condition, this would be difficult for the U.S. commercial aviation industry to absorb.

- The economic forecasts used to develop this year's aviation predict a strong recovery starting in mid to late 2003. Should the recovery be weaker, it could push out the recovery in travel demand for another year.

- For commercial aviation to recover its traffic and profitability, business travel must return to pre-2001 levels. The return of business

travel depends on the recovery and strength of future U.S. and world economic activity.

- The current forecast projects only a 0.5 percent annual increase in fuel prices over the 12-year forecast period. The risk of war with Iraq and political unrest in Venezuela have the potential to push energy prices considerably higher than forecast. Should this occur, the impact on U.S. and world economic growth and air travel could be considerable.

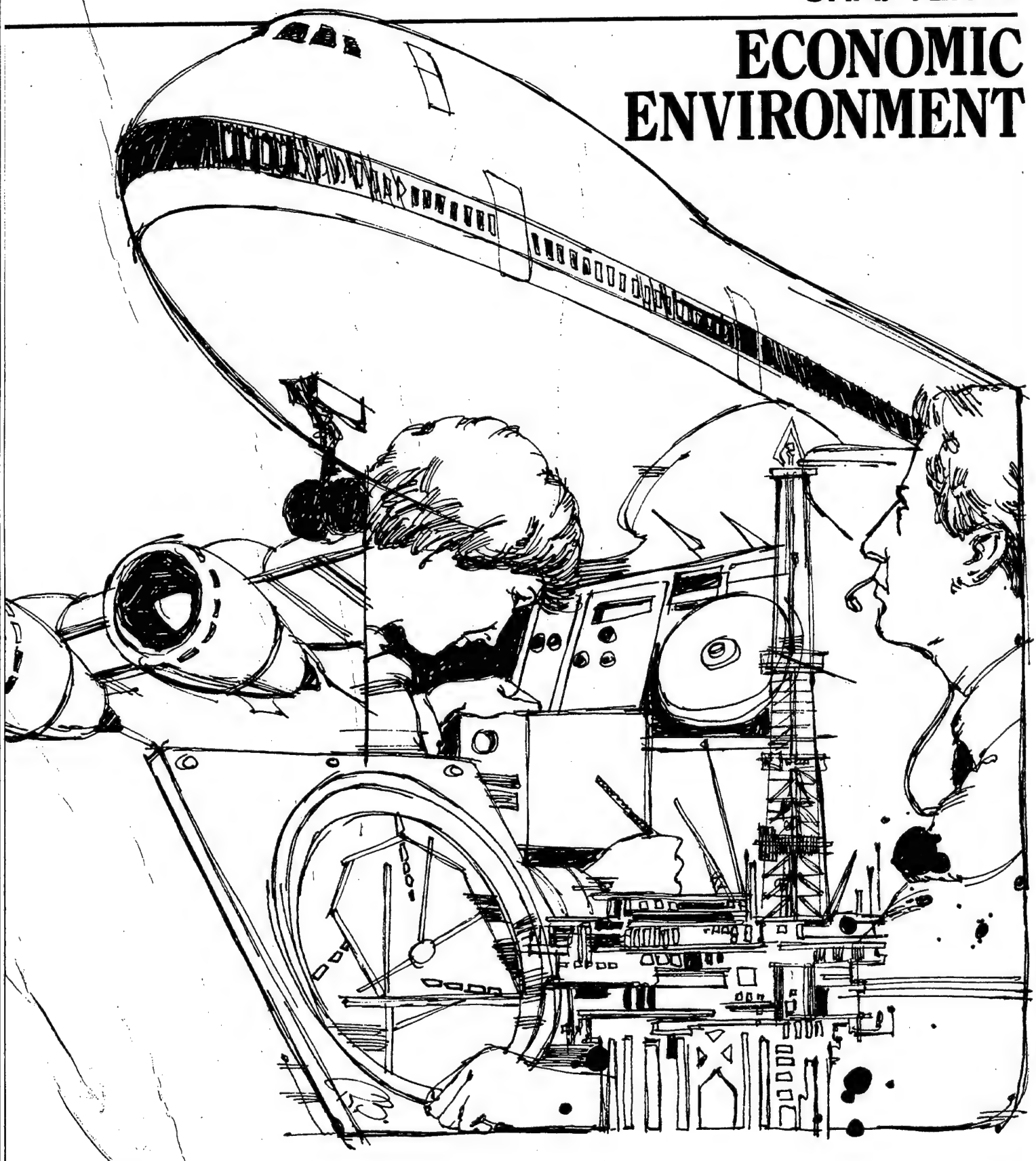
- The strong economic recovery forecast in Asia/Pacific and Latin American countries also could be overly optimistic. The current economic problems impacting both Japan and Argentina have the potential to worsen and spread to other Asia and South America countries. This would slow the traffic recovery forecast in these regions.

- Heightened security measures at U.S. airports have increased the processing times for check-in and security clearance. If these lengthy check-in times continue, a large part of short-distance scheduled air travel could be shifted to other transportation modes or travel alternatives such as teleconferences. The loss of this traffic, mostly higher priced business travel, would impact heavily on the profitability of U.S. commercial airlines.

Nevertheless, FAA expects air travel to continue as the mode of choice for both long distance domestic inter-city travel and international passenger markets throughout the foreseeable future.

CHAPTER II

ECONOMIC ENVIRONMENT



CHAPTER II

ECONOMIC ENVIRONMENT

This chapter discusses the economic environment and data used in forecasting aviation demand. These data are taken from several sources. United States economic data, derived from annual and quarterly statistics, are taken from the Office of Management and Budget (OMB), Congressional Budget Office (CBO), and a private forecasting service—Global Insight, Inc. (Formerly DRI-WEFA). Quarterly data for the three series used to develop the aviation demand forecasts--Gross Domestic Product (GDP), the Consumer Price Index (CPI), and the Oil and Gas Price Index--are presented as seasonally adjusted annualized rates.

Fiscal year (FY) estimates are calculated by averaging the 4 quarters for the period October through September. Global Insight, Inc. international economic estimates provide the basis for developing the international aviation forecasts. The specified years for the economic data discussed in this chapter are as follows: United States economic data is on a fiscal year basis and international economic data is on a calendar year (CY) basis, unless otherwise indicated.

REVIEW OF 2002

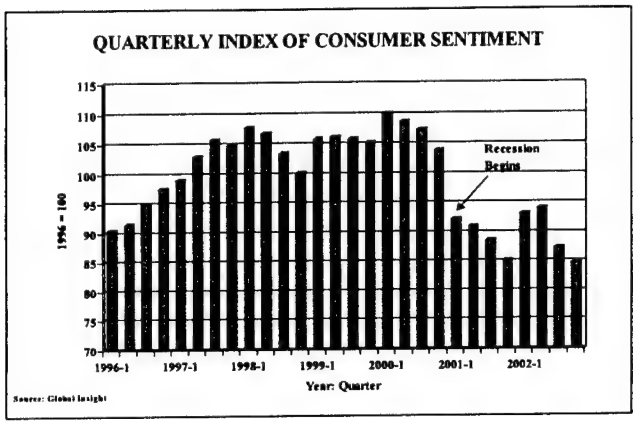
The U.S. economy experienced its 10th recession since the end of World War II during the last 3 quarters of FY 2001, which ended with the events of September 11th. The U.S. economic recovery from the downturn and terrorist attacks has proceeded in a sluggish manner. World growth also slowed considerably during the year with all major regions of the world showing a slowdown or only weak improvement.

UNITED STATES

The 1st quarter of 2002 marked the end the 3 quarter economic downturn with a 2.7 percent annual growth in GDP. The recession began in the 2nd quarter of 2001 and registered declines of 0.6, 1.6, and 0.3 percent over a 3 quarter period. This downturn ended the longest economic expansion in U.S. history, which spanned the decade of the 1990s and totaled 41 quarters. The 2nd quarter 2002 brought a surge in growth of 5.0 percent due, in large part, to a build up in inventories. Growth moderated in the 3rd and 4th quarters with GDP growing 1.3 and 4.0 percent, respectively. For the year, the U.S. economy expanded by 1.7 percent, double

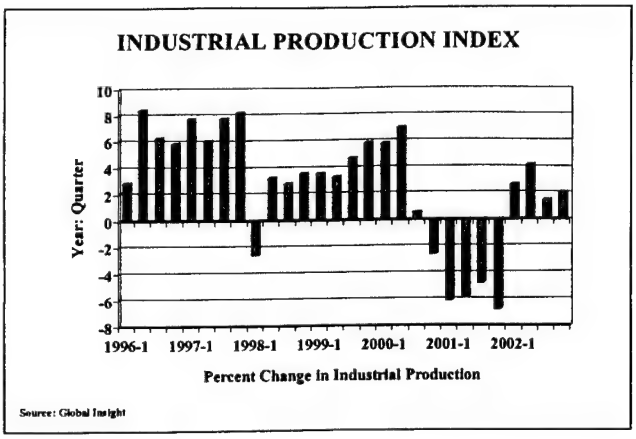
the 0.8 percent growth in 2001, but far below growth of 4.3 percent in 2000.

Consumer confidence as measured by the Index of Consumer Sentiment, University of Michigan, fell off sharply at the onset of the 2001 recession. The index, which reached a high of 110 in early 2000, fell to 85 in the 4th quarter of CY 2001. The index rose substantially in the 1st and 2nd quarters of CY 2001, a possible harbinger of a recovery. However, this rally fizzled in the 3rd and 4th quarters suggesting a weaker recovery.



Demonstrating the depth of the downturn, the following chart shows a substantial decline in industrial production beginning in the 1st quarter CY 2001 and extending through 1st quarter 2002. Like the consumer confidence index, the recovery of industrial production also appears weak, having fallen off in the 3rd and 4th quarters of CY 2002.

Price inflation, measured by the consumer price index (CPI), slowed to 1.5 percent in 2002, less than half the 2001 rate. Volatile energy prices, as measured by the oil and gas price deflator fell 14.1 percent during 2002 after a rise of 5.5 percent a year earlier.



The unemployment rate reached 6.0 percent in April 2002 and has remained between 5.6 and 6.0 percent through November. In 2001, the rate ranged from 4.2 to 5.8 percent, gradually rising through the year. Much of the large increase in unemployment occurred after September 11th and is due, in part, to the major disruptions in the travel and service industries.

In 2001, the Federal Reserve Board (FED) lowered interest rates 11 times as the economy struggled its way out of recession. However, believing that the U.S. economy was headed for recovery, the FED left interest rates unchanged until November 6th, when it cut the overnight interest rates (the rate banks charge one another for overnight funds) by a half a percentage point, to 1.25 percent. Separately it lowered the rate that banks pay when they borrow from regional Federal Reserve banks to 0.75 percent, the lowest rate in the FED's history. This rate cut underscores the FED's changing view that the economy may not sustain the recovery.

WORLD

Worldwide GDP expanded by 1.8 percent in 2002, slightly above the 1.2 percent growth of a year earlier but far below the 3.9 percent expansion in 2000. The relatively weak recovery reflects the lack of an engine to propel growth forward. Uncertainty generated by the

political tensions in the Middle East has dampened worldwide economic activity. Furthermore, major corporate scandals in the U.S. have shaken confidence in capital markets.

Western Europe suffered significantly from the 4th quarter 2001 contraction that developed after September 11th. European GDP growth fell to 1.0 percent in 2002, down from growth of 1.4 percent in 2001 and 3.6 percent in 2000. Europe's largest economy, Germany, stagnated in 2002 with GDP growing only 0.3 percent. Both consumer and business confidence are down substantially throughout Europe. Passive monetary and fiscal policies under European authorities have exacerbated Europe's economic woes.

In Eastern Europe GDP grew a modest 2.7 percent, the same as a year earlier but more than a percentage point off the 2000 pace. The moderation in growth for emerging Europe occurred because of a drop in the external demand for products that they supply to the economies of the developed world.

The Middle East and North Africa are primarily oil-based economies highly dependent on the volatile price of this fuel. The relative stability in oil prices over the past year has provided a reasonable platform for economic growth in the region. The region's GDP expanded by 2.4 percent in 2002, just above the 2.2 percent increase of a year earlier.

The combined GDP of Asia (including Australia and New Zealand) grew at a 2.2 percent rate in 2002, up from 1.8 percent last year. However, Japan, Asia's largest economy continued a decade long pattern of sluggish growth with a 0.2 percent decline in GDP. Asia has benefited from both healthy consumer demand and growth in exports. In particular, the weakness in the U.S. dollar has assisted exports in countries such as China and Malaysia, which peg their currency the U.S. dollar.

The near-term future for Latin America appears particularly bleak. The combined economies of Latin America fell by 2.6 percent in 2002. The region's second largest economy, Argentina, declined drastically in 2002 with GDP falling 12.2 percent, causing ripples throughout the region.

The G-7 nations—U.S., Canada, United Kingdom (U.K.), Germany, Italy, France, and Japan—demonstrated moderate to negative growth in 2002. These seven national economies make up two-thirds of the world's output. GDP growth rates ranged from a high of 3.3 percent in Canada to a negative 0.2 percent in Japan.

Price inflation also remained quite low among the G-7 in 2002. Italy faced the highest inflation rate among these industrial leaders with a 2.4 percent rise in the price level, while a 1.0 percent decline in consumer prices raised deflationary concerns in Japan. The remaining five countries experienced price increases ranging from 2.2 percent in the U.K. to 1.3 percent in Germany.

Among the G-7 nations, short-term interest rates ran from a high of 4.0 percent in the U.K. to a low of 0.1 percent in Japan. With the exception of Japan, which has the same short-term rate as a year ago, rates dropped in each of the other six industrialized nations. The largest interest rate decline occurred in United States, down 170 basis points.

The Japanese yen (¥) and Canadian dollar (C$) both continued to depreciate against the U.S. dollar during 2002. The cost of US$1.00 increased from ¥121.5 to ¥125.3 and from C$1.55 to C$1.57. Both the Euro and the British pound appreciated against dollar. The cost of a dollar in Europe fell from 1.12 to 1.06 Euro while it took only £0.67 in 2002 to purchase a dollar compared to £0.69 a year earlier.

U.S. ECONOMIC OUTLOOK

The economic assumptions used in developing the FAA baseline aviation forecasts are derived from estimates provided by the Executive Office of the President, Office of Management and Budget The GDP projections are Bureau of Economic Analysis (BEA) chain-weighted estimates with a base year of 1996. Forecasts for the Congressional Budget Office and Global Insight are also shown.

SHORT-TERM ECONOMIC OUTLOOK

Graphics on the following page present an optimistic picture of economic growth during the next 2 fiscal years. OMB projects GDP to grow 1.5 and 2.7 percent in the 1st and 2nd quarters of 2003, then expand at rates ranging from 3.4 to 3.7 percent over the next 6 quarters. Global Insight sees the recovery somewhat differently with the 1st quarter 2003 growth of 0.6 percent rising to 3.2 percent in 2nd quarter and peaking at 5.6 percent in 2nd quarter 2004.

Moderate price inflation is expected to accompany the economic rebound in 2003 and 2004. CPI increase is projected to increase 2.6 percent in the 1st quarter 2003 and remain between 1.9 and 2.1 percent over the next 7 quarters. Fuel prices, as measured by the oil and gas price index, are expected remain volatile through 2003 before leveling off in 2004. OMB expects energy prices to fall in each quarter of 2003 and the 1st quarter of 2004 at annual rates of between 10 and 15 percent. Oil prices are forecast to increase between 1.2 and 1.8 percent during the last 3 quarters of 2004.

LONG-TERM ECONOMIC OUTLOOK

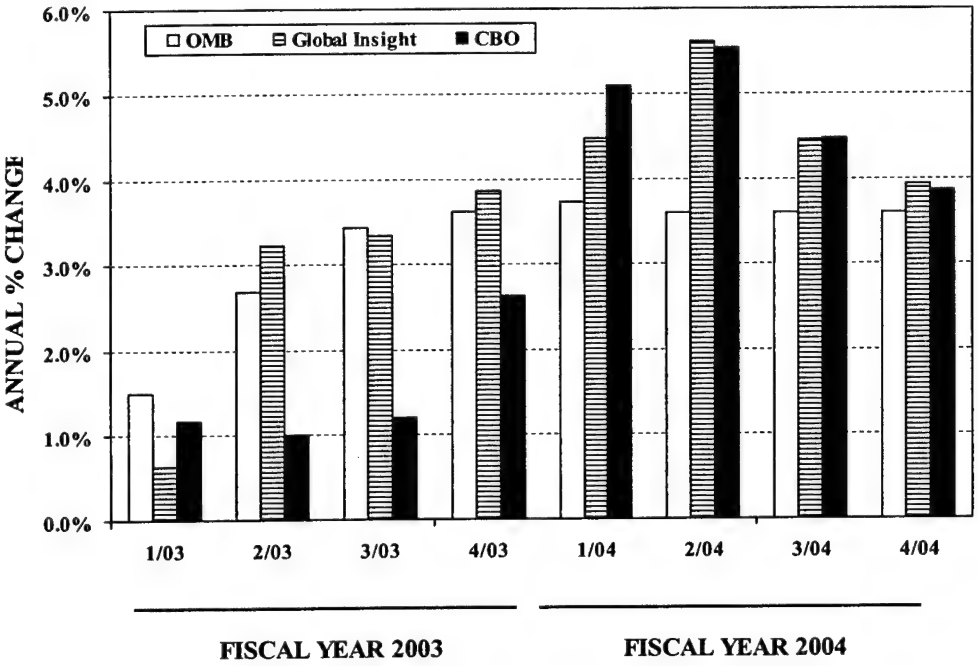
The long-term economic outlook for the U.S. economy shows real GDP growth averaging 3.2 percent over the 12-year forecast. Long-term growth in GDP is based on growth in the factors of production—labor and capital. The relative mix these factors combined with the state of technology determines proportional productivity of each factor. Labor supply depends on population growth and its composition. National savings determine capital accumulation. Technology expands the productivity of labor and capital. In sum, changes in the factors of production and increases in the productivity of those factors determine economic growth.

Although still recovering from the recent recession, the U.S. economy finds itself poised for substantial long-term income growth. While the labor supply will expand at only a moderate rate during the forecast period--elements that include low interest rates, continued capital investment, further productivity improvements from the cyber revolution, and growth in the internet—provide a solid base for future expansion.

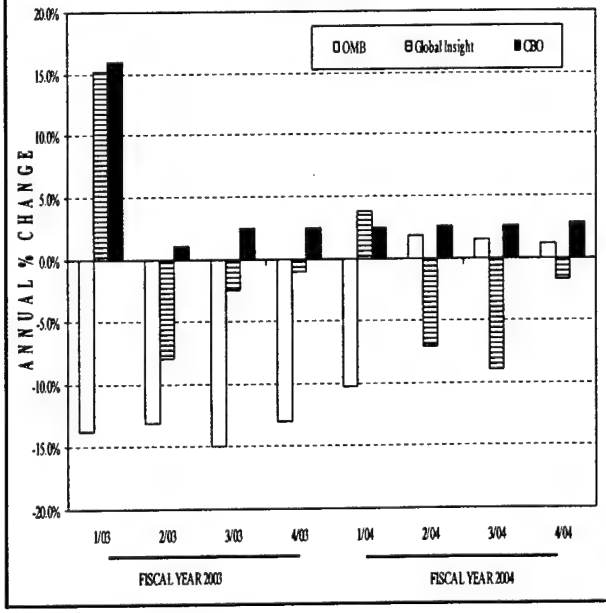
The U.S. population is expected to expand at 0.8 percent annually over the forecast period according to Global Insight. Based on the growth in population and considering labor force participation rates, the U.S. labor force will grow at a 0.9 percent pace over the period. Employment is projected to increase from 134.6 to 153.0 million between 2002 and 2014 or 1.1 percent annually.

U.S. SHORT-TERM ECONOMIC FORECASTS

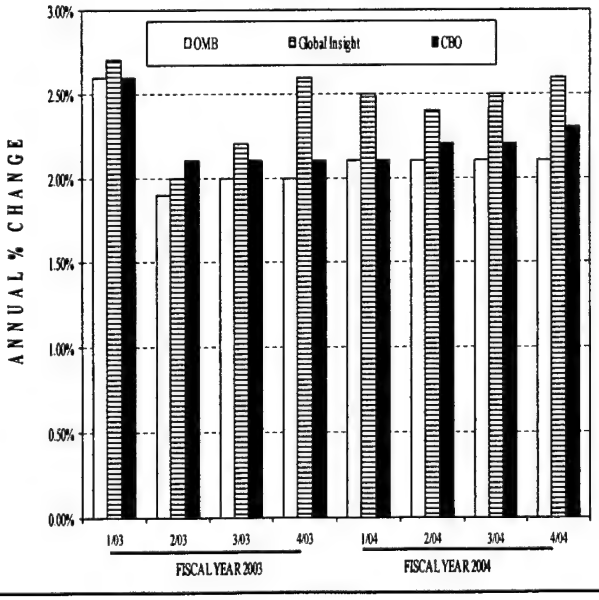
REAL GROSS DOMESTIC PRODUCT
(1996 DOLLARS, CHAIN-WEIGHTED)



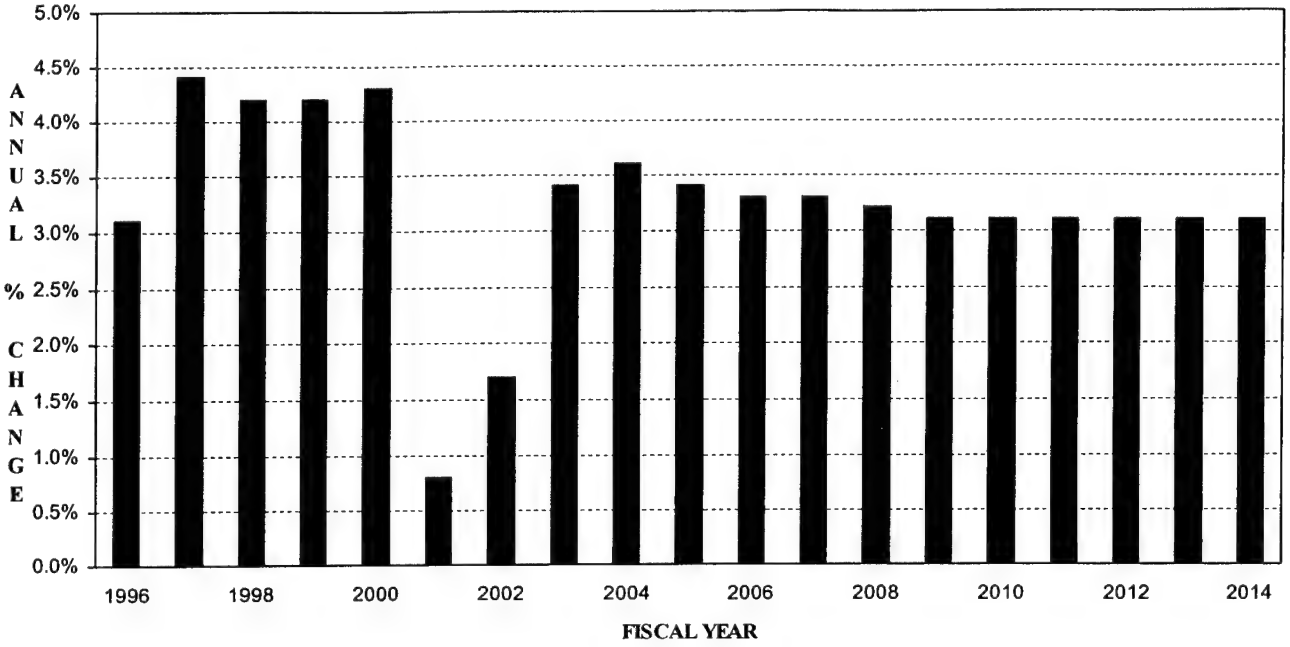
OIL AND GAS PRICE INDEX
1996=100



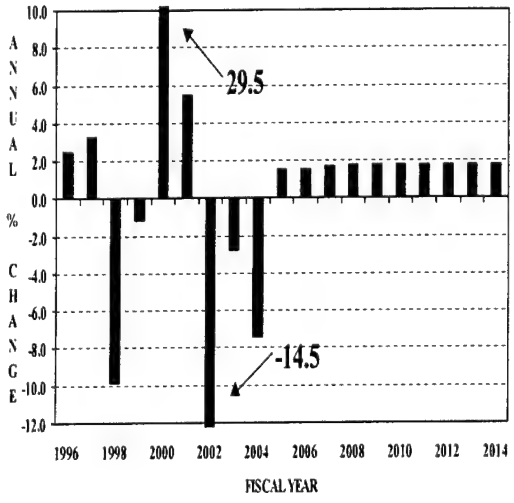
CONSUMER PRICE INDEX
(1982-84 = 100)



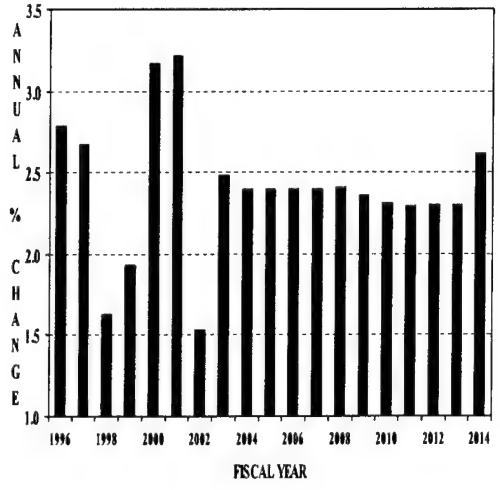
U.S. LONG-TERM ECONOMIC FORECASTS
GROSS DOMESTIC PRODUCT
(1996 DOLLARS, CHAIN-WEIGHTED)



OIL AND GAS PRICE INDEX
(1992=100)

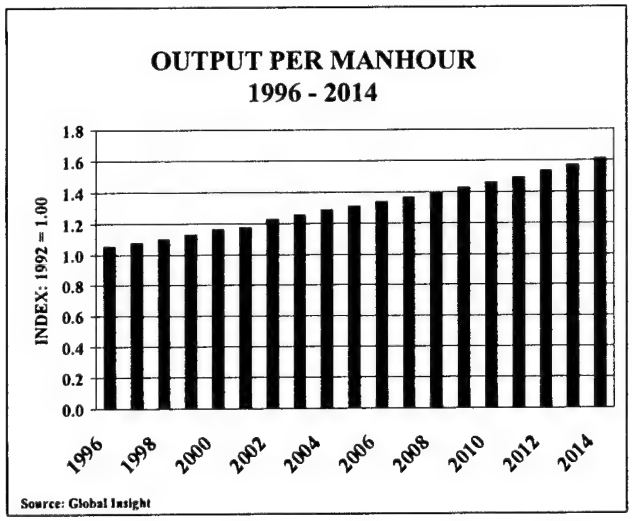


CONSUMER PRICE INDEX
(1982-84=100)



Human capital (education and skills), physical capital (machines and computers), and technology primarily determine labor productivity. Business investment, accumulation of capital, will remain at 12 to 13 percent of GDP during the forecast period. In real terms, capital stock will increase at a rate of about 4.5 percent annually, slightly above the pace seen in the past 30 years. This bodes well for increased labor productivity. Because of insufficient savings and a Federal budget deficit, U.S. investment will depend in part on international capital inflows.

Productivity, as measured by output per hour, is forecast to rise 2.5 percent annually over the next 12 years. The following graph presents historical and forecast output per hour between 1995 and 2014.



Inflation is expected to remain moderate during the forecast period. The consumer price index is projected to increase at an annual rate of 2.2 percent through 2014. Although expected to fall over the next 2 years (down 2.7 and 7.4 percent in 2003 and 2004), volatile oil and gas prices are projected to settle down and increase at an average annual rate of 1.7 percent over the last 10 years of the forecast period. In real terms, oil prices are expected to decline at an annual rate of 1.7 percent over the 12-year forecast period.

ALTERNATIVE FORECASTS

Alternative short-term U.S. economic forecasts in Chapter X, Table 1, were prepared by OMB, Global Insight, and CBO. Table 3 presents the Global Insight long-term forecasts for both fiscal and calendar years. In the long run, the differences between the fiscal and calendar year forecasts are small.

Over the 12-year forecast period, the Global Insight GDP forecast is slightly higher than that of OMB--3.3 versus 3.2 percent annually. CBO projects growth of 3.1 percent over the same period. Global Insight projects price increases averaging 2.3 percent annually compared to OMB and CBO forecasts of 2.2 and 2.4 percent, respectively.

The major difference between the three forecasts relates to future fuel prices. OMB forecasts that fuel prices will increase only 0.5 percent (down 1.7 percent in real dollars) annually over the 12-year period. CBO and Global Insight project fuel prices to increase at annual rates of 3.4 and 2.3 percent, respectively, over the same time period. In real terms, CBO forecast annual increases of 1.0, while Global Insight sees growth as flat.

WORLD ECONOMIC OUTLOOK

The principal economic issues related to FAA's international traffic forecasts are discussed below. International economic data are presented in tabular form in Chapter X, Tables 4 and 5. International GDP data are presented on a calendar year basis and are expressed in 2000 U.S. dollars. GDP and exchange rates for individual countries, as well as groups of countries, are obtained from Global Insight.

WORLD GDP

The graphics on the following page depict both the historical trend and projected GDP growth for major economic regions of the world. Worldwide GDP is projected to increase by nearly $908 billion to a level of $33.2 trillion in 2003, an annual increase of 2.8 percent. Over the 12-year forecast period, world output is projected to reach $47.6 trillion, an annual growth rate of 3.3 percent.

Canada

In the near term, Canadian economic growth will continue to outpace that of the U.S. The Canadian economy grew by 3.3 percent in 2002, double the U.S. and world rates. Canada's GDP growth is projected to increase its that pace in 2003 and 2004 to 3.4 and 3.7 percent. Although the Canadian economy remains heavily dependent on the health of the U.S. economy, it is well positioned to sustain long-term growth at a 3.0 percent annual rate.

Canada's major strengths at this time are its trading position as a member of the North American Free Trade Area (NAFTA) and an exchange rate that makes its exports attractive. World exports are projected to grow at 9 percent next year, while Canadian exports are forecast to grow at a 12 percent pace. With the recovery of the U.S. economy, Canada remains well poised to take full advantage of its close economic and political ties with its neighbors to the south.

A government and central bank both aiming towards stable long-term economic growth have carefully crafted Canadian fiscal and monetary policy. Since 1992, the Bank of Canada has focused it monetary policy on maintaining inflation in the 1 to 3 percent range. Global Insight projects Canada's price inflation at 2 percent over the forecast period. Fiscal policy in Canada has centered on a $100 billion tax reduction program. This program will lower all aspects of taxation. Although Canadian taxes remain higher than those in the U.S., tax reductions have assisted economic growth.

The primary risk to the Canadian economy remains the strength of the economic recovery in the U.S. If the U.S. economy recovers more slowly than anticipated, Canadian near-term growth will not reach levels now expected. Another risk affecting both the U.S. and Canada is the increased time required to process border crossings. Although delays have lessened since the initial impact of added security, the tighter security arrangements at the Canada/U.S. border have hindered the efficient flow of truck traffic for both imports and exports. The affect of these delays is significant given that exports to the U.S. contribute substantially to Canada's GDP.

Pacific/Far East

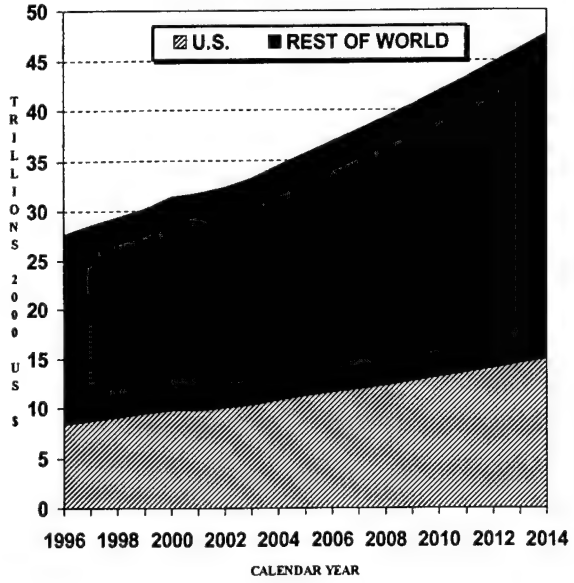
The combined economies of Asia and the Pacific--including Japan, the developing Asia Pacific, China, India, and Pakistan, along with Australia and New Zealand--produced a 2.2 percent growth rate in 2002, the 2nd consecutive year of sluggish growth in this vibrant economic region. Global Insight projects Asian GDP to increase 3.6 and 3.7 percent in 2003 and 2004.

Consumer demand within Asia has bolstered inter-Asia trade. This internal Asian trade has increased the export sector that was already experiencing increased trade with the U.S. Business investment is also projected to increase.

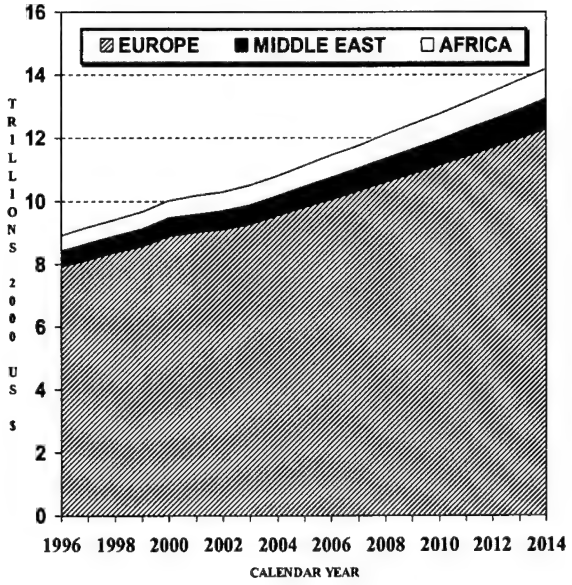
Japan's GDP, which makes up 55 percent of Asia's output, shrank 0.2 percent in 2002 after rising only 0.3 percent a year earlier. The world's second largest economy is projected to

GROSS DOMESTIC PRODUCT BY WORLD REGION

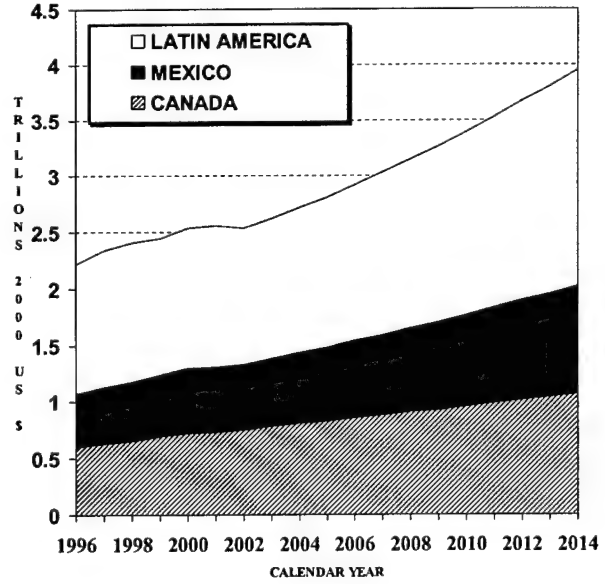
WORLD



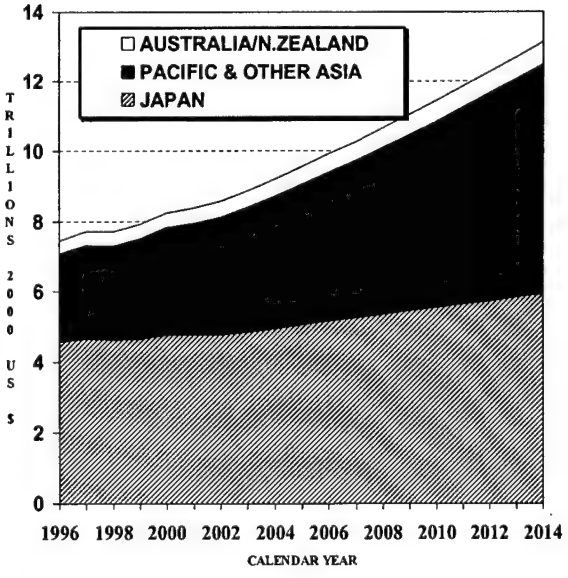
EUROPE/MIDDLE EAST/AFRICA



CANADA/MEXICO/LATIN AMERICA



JAPAN/PACIFIC & OTHER ASIA/AUSTRALIA & NEW ZEALAND



grow slowly over the next 2 years as the country attempts to climb out of its decade long slump. GDP is projected to grow by 2.0 and 1.8 percent in 2003 and 2004. Over the 12-year forecast period, Japan's economy is projected to expand by 1.8 percent annually.

Japan's lingering economic slump continues to show few signs of immediate near-term relief. Although the rest of Asia is projected to grow substantially, Japan continues to wrestle with the same economic problems it has dealt with for the past decade. The Japanese economy continues to suffer from two primary weaknesses: a financial system in need of substantial reform and price deflation.

Japanese banks are undercapitalized and saddled with bad loans. With so much bad debt, banks continue to resist making loans. With the exception of export firms, corporations are not borrowing based on the bleak near term expectation for growth.

Deflation continues to plague the Japanese economy. Falling prices have lowered domestic demand because both consumers and business have postponed purchases as they wait for lower prices. Deflation also raises the real cost of debt. Both corporations, who are saddled with large outstanding loans, and the government, who borrowed heavily to fund deficit spending over the past several years, find repayment of this debt burdensome. Deflating prices also prevent the real interest rate from dropping, as the nominal interest rate is essentially zero. Hence, the Bank of Japan cannot stimulate the economy with lower interest rates.

Japan's structural inefficiencies continue because creditors allow bankrupt firms to continue operating thus maintaining excess capacity and adding to deflationary pressures. Japan also suffers from excess labor in the construction and manufacturing sectors. Unemployment reached 5.3 percent in 2002 and is expected to continue to rise. Japan's system of "lifetime" employment appears to be a notion of the past.

The economies of the Pacific and developing Asia--the Pacific Basin, China, India, and Pakistan--show surprising strength. This region which experienced an average growth rate of 6.7 percent during the 1990's, slumped to a 4.0 percent pace in 2001, but increased to 5.6 percent in 2002. The combined GDP of these countries is projected to grow by 6.0 and 6.3 percent annually over the next 2 years. Over forecast period, these Asian economies will increase its GDP by $3.2 trillion (5.8 percent annually), nearly double the current level.

Pacific Basin countries appear to have recovered from their slump of 2000, growing by 4.1 percent in 2002. These countries GDP is expected to increase by 4.7 and 5.3 percent in 2003 and 2004, then average 4.9 percent a year over the 12-year forecast. China continues to drive this area's economic growth, expanding at a 7.9 percent pace rate in 2002. Over the forecast period, China is projected to grow 6.9 percent annually.

Although Asia appears to have a prosperous future, the region holds numerous risks. Terrorism threatens many Asia nations with the emergence of radical Islamic groups. The recent terrorist attacks in Bali have created uncertainty over Indonesia's economic future. Another risk is the needed institutional reform that constrains many Asian countries. Although China and South Korea have moved toward reform of their financial institutions, several Asian nations, most notably Japan, have dragged their feet on reform.

Latin America

Mexico and Latin America are struggling through tough economic times. The GDP of Mexico rose a mere 0.9 percent in 2002 after falling 0.3 percent a year earlier. In Latin America, GDP fell 2.6 percent in 2002 but is projected to grow by only 1.8 percent in 2003. Over the forecast period, this region is expected to grow at a 3.9 percent annual pace. The combined economies of Mexico and Latin America are projected to increase at an annual rate of 4.0 percent over the next 12 years.

Argentina remains immersed in the worst political, social, and economic crisis in its history without a solution in view. Its economy is in shambles with half of its population below the poverty line and an unemployment rate of 23 percent. Argentina is experiencing a depression of the magnitude not experienced in the U.S. since the 1930's.

As Latin America's second largest economy, Argentina, will undergo a 12.2 percent loss in GDP during 2002 but is forecast to increase by 0.5 percent in 2003. The export sector provides the one bright spot in the Argentine economy. Although merchandise exports fell by 2.6 percent in 2002, this sector is expected to grow by 3.4 percent in 2003. The spur to this sector came from a drastic devaluation of the peso that decreased its value relative to the U.S. dollar by two-thirds. The peso is expected to continue to devalue over the next few years.

With its economy in ruins and a recent default on a World Bank loan, Argentina faces substantial problems with the International Monetary Fund over another loan agreement. To stabilize the country and its economy, Argentina has undergone market and political reforms with only partial success. In the past decade, Argentina privatized inefficient, corrupt state-owned enterprises and opened up its economy to domestic and international competition. However, political and fiscal reform remains elusive.

Brazil, Latin America's largest economy, grew by a 1.0 percent in 2002 and is forecast to grow by 1.5 percent in 2003. The slump is expected to end in 2004 with projected GDP growth of 3.2 percent. The long-term growth target for Brazil is 4.2 percent.

Although Brazil has an optimistic long-term economic outlook, its economy has several short and mid-term risks. Most immediately the change in the Brazilian political landscape may threaten its ability to finance and roll over its debt. Uncertainty regarding the likely policies of the newly elected populist government presents significant risks for financial markets.

Mexico, a country heavily dependent on its northern neighbors, grew by 1.5 percent in 2002 after suffering a yearlong downturn in 2001. Growth is projected to expand by 3.1 and 4.0 percent in 2003 and 2004. Mexico is expected to average 4.2 percent annual growth over the forecast period.

The Mexican central bank will continue to pursue a tight monetary policy as it remains focused on a target inflation rate of 3.0 percent. Mexican fiscal policy emphasizes fiscal responsibility that calls for increased taxes. The government is expected to continue to lower the budget deficit as targeted.

As usual, Mexico's largest risk comes from its heavy dependency on the U.S. economy and the economic malaise affecting the rest of its southern neighbors. If the U.S. economy slows or if the downturn in Latin America worsens, the Mexican economy may dip into recession again.

Europe/Middle East/Africa

The combined economies of Europe (Eastern and Western), the Middle East, and Africa are projected to grow by 2.0 and 2.9 percent in 2003 and 2004, after rising a meager 1.2 percent in 2002. Over the 12-year forecast period, this European dominated region is expected to grow by 2.7 percent a year. Western Europe, responsible for 85 percent of the region's output, grew by 1.0 percent in 2002. This region is dominated by the European Union (EU) countries--Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, and the United Kingdom--and is forecast to increase by 1.8 and 2.7 percent over the next 2 years. Over the forecast period, Western Europe is projected to grow 2.4 percent annually.

Europe's already declining production received a shock in the wake of September 11th terrorist attacks that sank business and consumer confidence to long-term lows. Domestic demand continues to be weak and the export sector that had led the recovery has come under pressure from weaker world output.

Prices in Western Europe rose 3.6 in 2002 and are forecast to rise 3.2 and 2.7 percent in the next 2 years. Interest rates among the six largest economies of Europe—Germany, France, U.K., Italy, Spain, and the Netherlands-- ranged from 4.0 in the U.K. to 3.3 in each of the other five countries. In 2003, rates are projected to rise to 4.6 in the U.K. and drop to 2.8 percent in the remainder or these countries with the exception of France whose rate is expected to rise to 3.4 percent.

The European outlook has significant risks. Fiscal policy among European Union members could become excessively restrictive as governments move towards targets committed to under the Stability and Growth Pact. The European Central Bank may over tighten monetary policy in an attempt to stem inflationary concerns. A rise in the value of the Euro relative to the dollar would weaken the EU export competitiveness.

Eastern Europe's GDP expanded 2.7 percent in 2002. Each of the regions largest economies—Poland, the Czech Republic and Hungary—continued to show growth, although Poland GDP grew by only 1.3 percent. This emerging economic region is projected to grow 3.6 and 4.3 percent in 2003 and 2004. For the forecast period, Eastern Europe is projected to grow 4.1 percent a year.

The former Soviet Union's economy grew (GDP up 4.8 percent) at nearly twice the pace of Eastern Europe and more than four times the rate of Western Europe during 2002. These countries are projected to expand 4.4 and 3.8 percent over the next 2 years. Over the forecast period, the region is projected to expand 4.3 percent a year.

The oil-producing region of the Middle East grew by 1.8 percent in 2002 and is forecast to rise 3.2 and 4.0 percent in 2003 and 2004. For the next 12 years, the region is expected to grow at a 4.0 percent annual rate. This region's dependence on the production, sale, and export of oil places its fate in the hands of the volatile oil market. An increased supply of oil from Russia and possibly Iraq could send the price of oil down rapidly, creating a substantial risk for this region.

The most significant risk in this part of the world remains the manifold political and war related concerns. One concern is related to the on-going conflict between Israel and Palestine and the increased terrorist activity that has accompanied that conflict. A second major area of concern is a potential war in Iraq. This conflict could have broad implications for the stability of governments in the region.

African economies grew by 2.9 percent in 2002. This commodity rich continent is forecast to grow by 3.4 and 4.4 percent in 2003 and 2004. Over the forecast period, African GDP is forecast to expand by 4.2 percent annually. Political stability and commodity prices remain the primary concern in most of the countries of this very large continent. If the political instability of the Middle East spreads to North Africa or if commodities prices continue to fall substantially, the positive growth scenario for African nations could diminish.

DOLLAR EXCHANGE RATE

The graphics on the following page show historical and forecast values for the U.S. trade-weighted nominal exchange rate index with selected other developed countries.[1] The trade-weighted exchange rate measures the relative purchasing power of the U.S. dollar against economically developed countries accounting for trade differences. The graph also displays the historical and projected dollar exchange rates against the Japanese yen and the Euro. Table V in Chapter X displays the historical and forecast exchange rates from 1997 to 2014 for the Canadian dollar, the British pound, the Japanese yen, and the Euro.

In trade-weighted terms, the dollar fell marginally against its major trading partners in 2002. The U.S. dollar is projected to continue to fall throughout the 12-year forecast period, declining at an average annual rate of 1.5 percent. The U.S. dollar rose against the Canadian dollar in 2002--one Canadian dollar cost $0.666 in 2002 compared with $0.646 a year earlier. The downward trend in the Canadian dollar is expected to reverse in 2003, rising to $0.656 in that year and continuing to rise throughout the forecast period, reaching $0.775 by 2014.

The Japanese yen also depreciated against the dollar, falling 3.0 percent to $7.98 per ¥1,000. Over the forecast period the yen is forecast to rise against the dollar by an average 1.8 percent per year, reaching $9.94 per ¥1,000 in 2014. The Euro rose 5.0 percent against the dollar in 2002. Over the next 12 years, the Euro is projected to rise by 1.7 percent a year--from 0.94 to 1.15 to the dollar in 2014.

U.S. REGIONAL ECONOMIC GROWTH

The 2001 recession and its manifold difficulties, including the terrorism of September 11th, the fall of the stock market, and the bursting of the high tech bubble, brought with it considerable hardship in the U.S. Although all regions suffered, those more reliant upon tourism and air travel, high tech firms, finance and manufacturing felt the impact of the slump somewhat more.

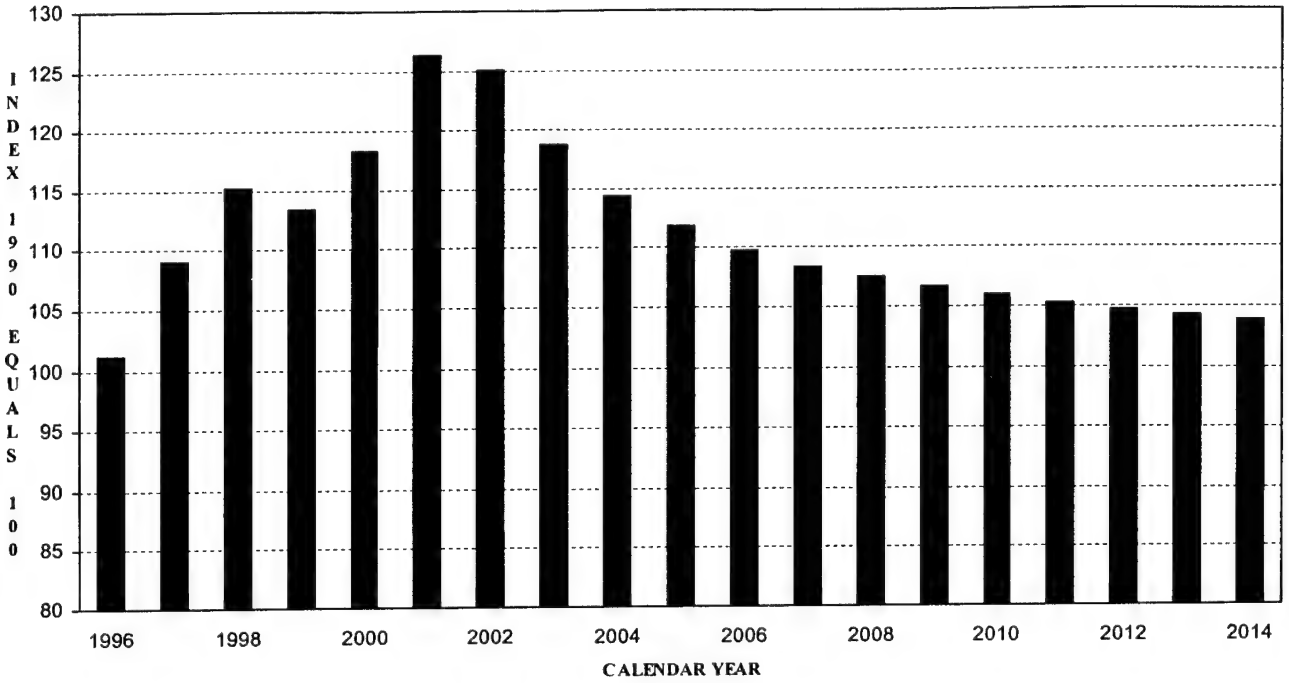
While a downturn in manufacturing led the slump, other factors combined to produce a broad-based recession affecting most states and all regions. Though the pop of the dot-com bubble had its largest impact in 2001, it continues to affect those regions that had prospered with the high-tech boom. The region most notably harmed by the bust in high tech are the West Coast, the Mountain states, and particularly Colorado, New England, and especially Boston, and Southern metros such as Raleigh-Durham, Atlanta, Dallas, and Austin. The impacts of the general stock market slide, while felt everywhere, most severely impacted financial centers such as New York and Charlotte. The terrorist events affected tourism dependent destinations such as Orlando, Las

[1] Note: A fall in the index implies a depreciation of the dollar against other currencies; a rise in the Euro and yen also implies a depreciation of the dollar against these currencies.

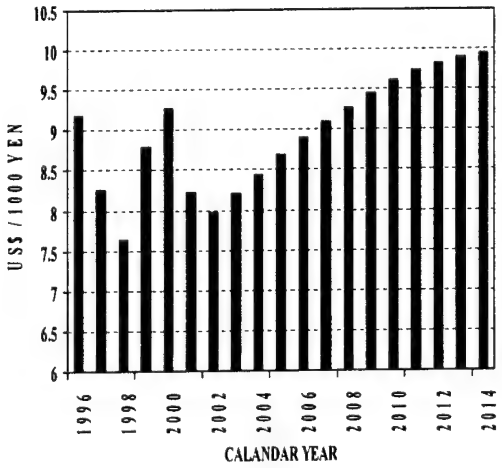
EXCHANGE RATE TRENDS AND FORECASTS

U.S. TRADE-WEIGHTED EXCHANGE RATE

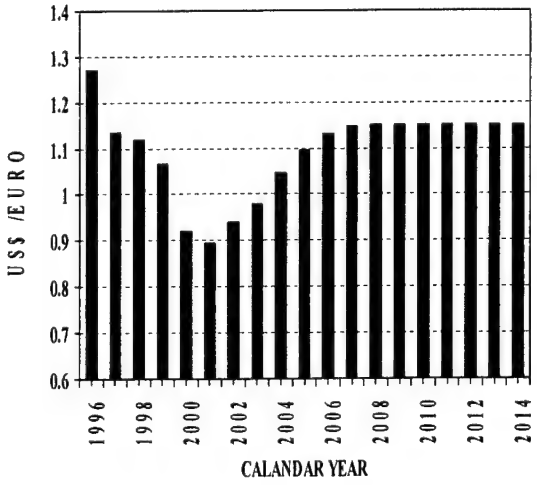
(NOMINAL RATE WITH OECD COUNTRIES)



JAPANESE YEN



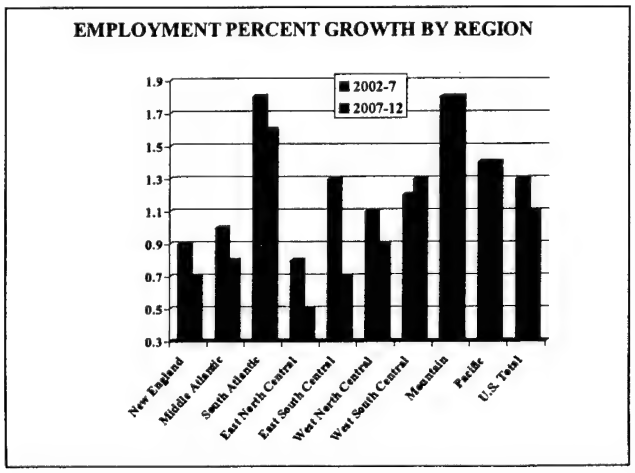
EUROPEAN UNION EURO



Vegas, and Hawaii. The accumulation of these factors resulted in a slump that left no region untouched. In 2002, employment declined in all nine census regions for the 2nd year in a row. In absolute and relative terms, the East North Central region—Illinois, Indiana, Michigan, Ohio, and Wisconsin--the industrial Midwest, lost the most jobs with employment dropping by nearly 200,000 or 0.9 percent; The Middle Atlantic states consisting of New Jersey, New York, and Pennsylvania lost 154,000 jobs or 0.8 percent. The East South Central—Alabama, Kentucky, Mississippi, and Tennessee—lost the least number of jobs (3,000), less than 0.1 percent.

The following chart shows the employment growth forecast by region for two time periods, 2002 to 2007 and 2007 to 2012. For the entire period, the South Atlantic (Delaware, the Virginias, the Carolinas, Maryland, Georgia, and Florida) and Mountain (Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming) regions show the largest employment gains.

The South Atlantic region has benefited from automotive manufacturing that has migrated steadily south and southeast in recent years. For instance, Georgia officials recently announced that it had been chosen as the site for DaimlerChrysler's new $754-million van plant. In the Mountain region aerospace and computer industry jobs will maintain employment growth.



Slowest growth will be experienced in the East North Central region (Illinois, Indiana, Michigan, Ohio, and Wisconsin). These rust belt states will continue to lose jobs to southern and western states.

The following table shows the 10 fastest growing metropolitan areas ranked by annual employment growth from 2002 to 2004. Las Vegas continues to lead the list, having become both a leading tourist destination and retirement community. All the cities on this list are in four states in the Sunbelt region: Florida (6), North Carolina (2), California (1), and Nevada (1).

TOP 10 METROPOLITAN AREAS IN EMPLOYMENT GROWTH 2002 - 04

Metropolitan Area	2002 Employment (000s)	2002-04 Growth (%)
Las Vegas, NV	798.0	3.6
West Palm Beach, FL	521.8	3.0
Sarasota, FL	284.6	2.8
Orlando, FL	910.5	2.8
Jacksonville, FL	577.5	2.7
Tampa, FL	1238.3	2.4
Charlotte, NC	839.4	2.4
Raleigh, NC	694.9	2.4
Riverside, CA	1063.2	2.3
Ft. Lauderdale, FL	702.7	2.2

RISKS TO THE FORECAST

A substantial threat to the U.S. and world economies comes from the potential outbreak of war in Iraq and the possible spread of that conflict throughout the Middle East. With weapons inspectors on the ground in Baghdad and the U.S. denouncing the Iraqi regime for its duplicity in hiding weapons of mass destruction, the likelihood that rhetoric will turn into a military conflict appears more and more likely.

A breakout of war in Iraq may paralyze travel between North America and Europe and send both economic regions into recession with a potential for a worldwide downturn. Such a war may also raise the price of oil at least in the short-term.

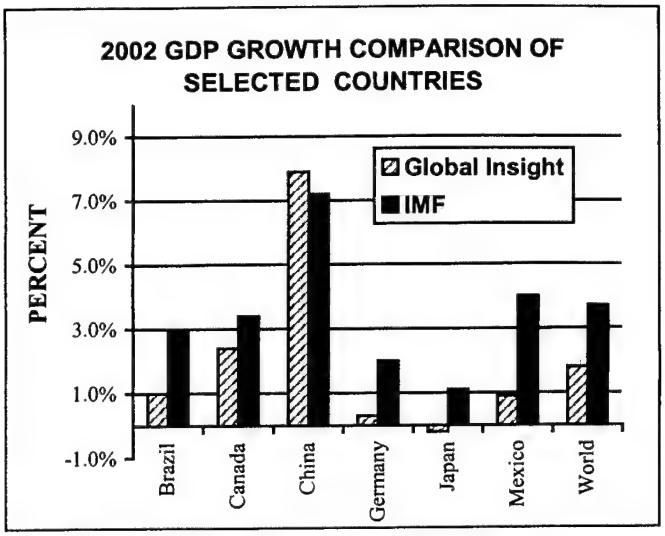
Additional global uncertainty comes from the U.S.-led war against terrorism. Potential hostilities with Iraq has strained relations among the countries of the North Atlantic Treaty Organization (NATO) and exacerbated tensions between the Western and Muslim states. Further, the Arab-Israeli conflict plays into the hands of extremists and al-Qaeda terrorists who exploit such tension by going after "soft" targets worldwide.

Deflation provides another significant risk to the world economy. The fragile global recovery is increasingly vulnerable because of the lack of pricing power in the goods sectors. Deflationary pressures have intensified in manufacturing and the traded goods sectors and have increased the risk of a double-dip recession.

Falling prices or deflation has severe economic costs. First, it affects consumption by reducing demand as buyers put off potential purchases. Deflation also makes debt more onerous for debtors. Hence, individuals and corporations will tend to borrow less (reduced spending and investment) or are more likely to default. In either case, economic growth declines.

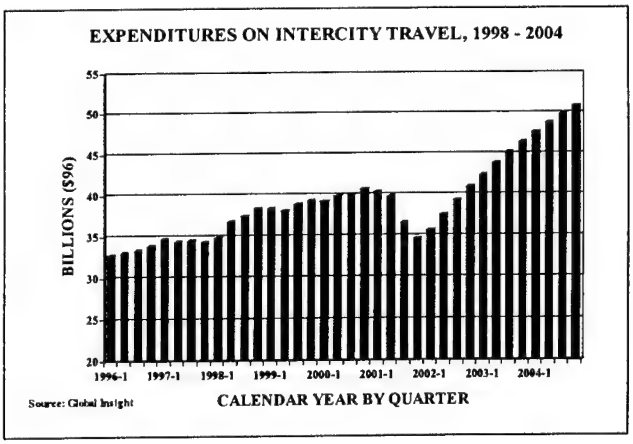
Another recent risk to the forecast is a possible reduction in import demand across the industrialized world. Global Insight reports that recent data from Japan, Europe, and the United States show a slowdown in imports.

Global Insight projects economic growth are more pessimistic that those of the International Monetary Fund (IMF) both in total for the world and for Mexico and Brazil. All in all, significant risks accompany the near-term forecast.



SUMMARY AND IMPACT ON AVIATION

The travel industry underwent considerable hardship following the events of September 11th and the 2001 recession. Expenditures on intercity travel declined 14 percent from their peak (4th quarter 2000) to its trough (4th quarter 2001). The following chart shows expenditures on intercity travel in the U.S. from the 1st quarter 1998 to the projected 4th quarter 2004. Although the industry recovered somewhat in early in 2002 it has remained flat for most of the year. Global Insight has forecast a full recovery of this sector with peak levels in 4th quarter 2000 exceeded in 4th quarter 2003.



Although projected to expand by 2.7 percent in 2003, the U.S. economy faces significant risks of further deterioration. Three factors—insufficient fiscal stimulus, a reduction in consumer expenditures, and a weakening of the housing market might produce a second dip to this slowdown. Global Insight puts the risk of a double dip recession at 30 percent.

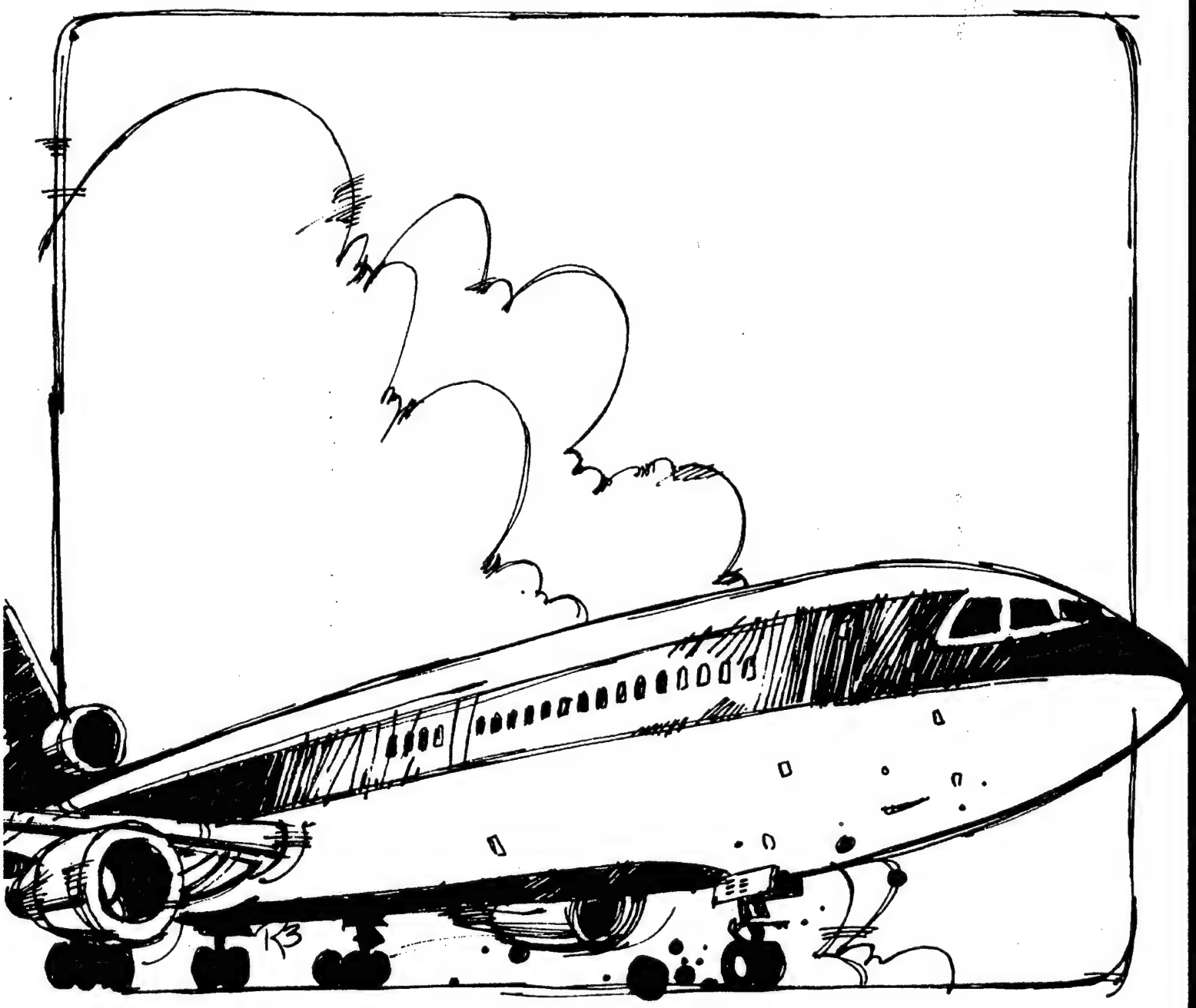
The aviation industry has several risk factors beyond the possibility of a second downturn in the economy. Another act of terrorism would upend airlines attempt to regain profitability. The outbreak of war in Iraq or the Middle East would significantly reduce trans-Atlantic traffic. Airline's inability to attract higher fares from their business passengers will seriously limit their profitability. So far six U.S. airlines have gone into bankruptcy in the wake of the terrorist attacks of September 11, 2001. Further bankruptcy and restructuring may leave the U.S. aviation industry substantially weakened.

Worldwide economic growth continued on a path of recovery in 2002 from the slump experienced in 2000 and 2001. Global GDP is slated to grow 2.6 percent next year and to expand at an annual rate of 3.8 percent in 2004. Over the 12-year forecast period, GDP is forecast to increase 3.3 percent annually.

Despite the rosy picture of the world economy faces several risks. The risk of war in the Middle East threatens the worldwide recovery. Deflationary pressures persist creating a threat to GDP growth. The economic woes of Japan and Argentina present added risk to the world forecast.

CHAPTER III

COMMERCIAL AIR CARRIERS



CHAPTER III

COMMERCIAL AIR CARRIERS

This year the FAA has revised the classification of carriers that are forecast to better reflect the nature of the carriers. Unlike prior forecasts in which the total Form 41 carriers were included in commercial air carriers, this year's forecast for commercial air carriers excludes those regional carriers who operate a majority of their flight using aircraft having 70 seats or less. The FAA historical database has been revised to incorporate these changes. In 2002, a total of 10 "regional" carriers reported for all, or a part of the year, on DOT Form 41.[1] In the discussion that follows, only large commercial carriers are included. In fiscal year 2002 there were 68 large U.S. commercial airlines (both scheduled and nonscheduled) reporting traffic and financial data to the Bureau of Transportation Statistics (BTS), U.S. Department of Transportation (DOT), on Form 41. There were 42 passenger airlines (operating aircraft with over 70 seats) and 26 all-cargo carriers.

Twenty-eight of the airlines provided scheduled passenger service and constitute the focus of the air carrier forecasts (both domestic and international) discussed in this chapter. Twenty-seven of the carriers provided scheduled domestic service (within the 50 States, the District of Columbia, Puerto Rico, and the U.S. Virgin Islands), while 15 of the carriers provided scheduled international service. Of the carriers providing scheduled international service, 8 served Atlantic routes, 10 served Latin American routes, and 7 served Pacific routes.

Air carrier traffic forecasts and assumptions discussed here are presented in Chapter X (Tables 6 through 23). FAA air carrier work-load forecasts are discussed in Chapter VII and presented in Chapter X (Tables 34 through 47).

It should be noted that all specified years in the remainder of this chapter are fiscal years (October 1 through September 30), and specified quarters are fiscal year quarters, unless designated otherwise.

REVIEW OF 2002

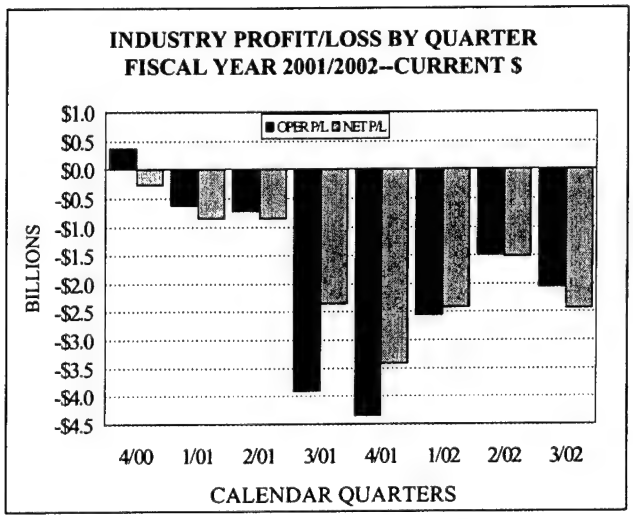
FINANCIAL RESULTS

For the 2nd consecutive year, operating expenses for large U.S. commercial airlines

[1] Air Wisconsin, American Eagle, Atlantic Southeast, Chicago Express, Comair, Express Jet, Executive, Horizon, Mesaba, and Trans States.

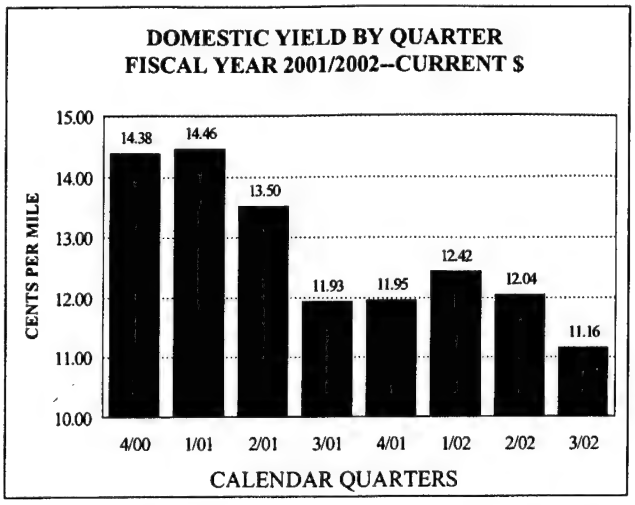
exceeded operating revenues. The poor financial performance in 2002 was driven by a reduction in traffic following the September 11th attacks, declining yields, escalating costs for security and insurance, and relatively high fuel prices.

The operating loss for the large U.S. commercial airlines was $10.5 billion in 2002, the largest in history. The industry posted operating losses in every quarter. For the year operating revenues decreased 16.3 percent, while operating expenses decreased 11.2 percent.

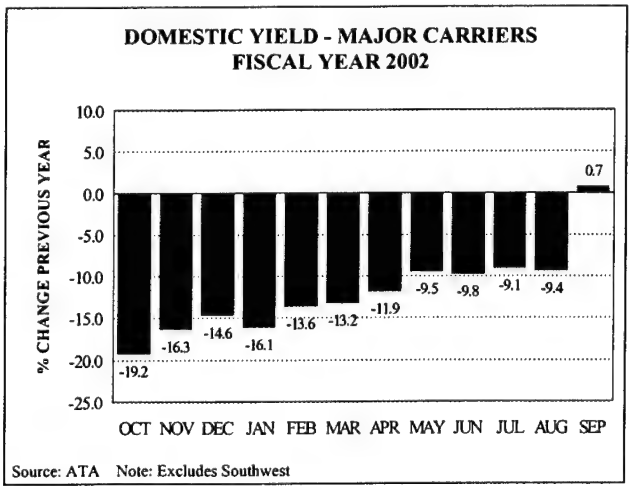


The decrease in operating expenses in 2002 was largely due to decreases in fuel and labor costs. After increasing 13.3 percent in 2001, fuel prices fell by an estimated 18.1 percent in 2002, reducing operating expenses by $3.0 billion. Industry labor costs, accounting for more than one-third of total operating expenses, fell 6 percent to $40.0 billion.

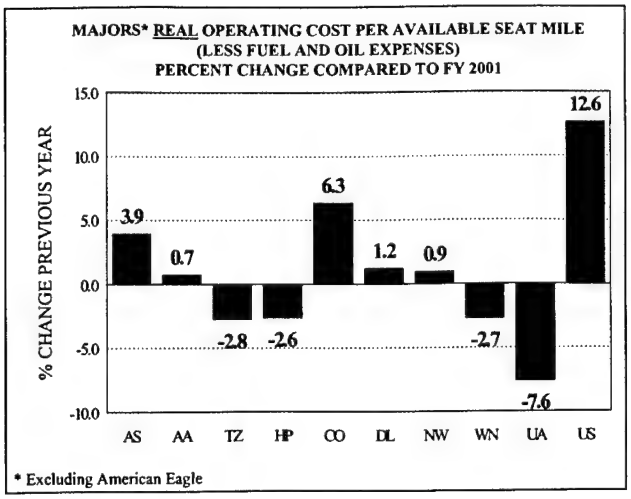
Domestic nominal yield for the large air carriers fell 12.1 percent, while yield, adjusted for inflation decreased 13.4 percent. Yield was down throughout the year as the decline in demand following the September 11th attacks led carriers to deeply discount fares in order to boost demand. Competition in the industry is intense as low fare carriers continue to expand their market share, and are expected to continue to increase their share in domestic markets throughout the forecast period.



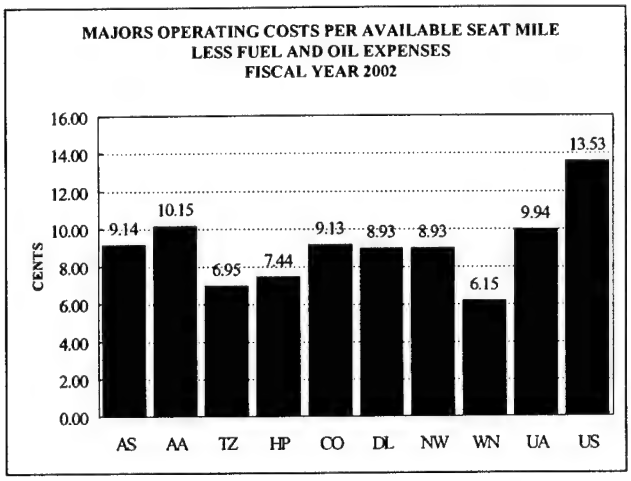
Nominal international yield decreased in all markets with the largest decline occurring in Latin markets. In Latin markets real yield declined 9.8 percent while in Atlantic and Pacific markets real yield decreased 6.0 and 9.0 percent, respectively. The falling yield in all of the international markets can be attributed to weak demand following the September 11th attacks and intense discounting by carriers.



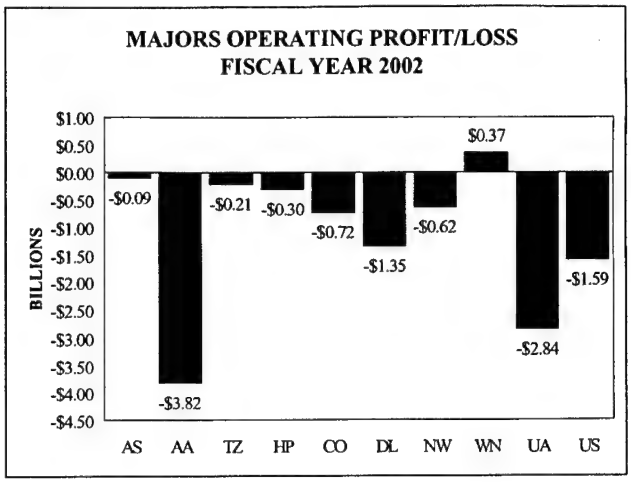
During 2002, four major passenger carriers reduced their real unit costs (estimated without fuel and oil expenses). United had the largest decline--down 7.6 percent, followed by Southwest with unit costs declining 2.7 percent. US Airways showed the largest increase, with unit costs up 12.6 percent.

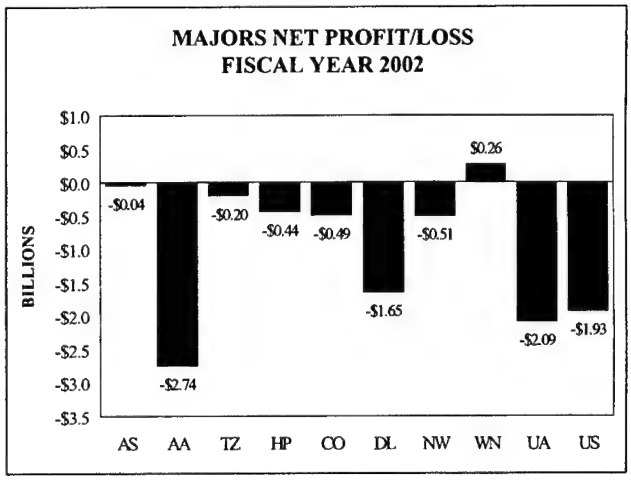


System average real operating cost per available seat mile (excluding fuel and oil) for the major passenger carriers was 9.4 cents in 2002, down 0.6 percent from 2001. System real unit costs (including fuel and oil) decreased 3.7 percent. In 2002, Southwest had the lowest operating cost (excluding fuel and oil) per available seat mile (6.15 cents). The highest unit cost among the major network carriers was US Airways with 13.53 cents.[2]



In 2002, U.S. large commercial airlines posted a net loss of $9.8 billion, a deterioration of $5.4 billion versus a net loss of $4.4 billion recorded in 2001. The next two graphs show operating and net profit and loss for the 10 major passenger air carriers.[3] Of the 10 carriers, 9 had operating losses in 2002. Only Southwest reported operating profits while American recorded the largest operating and net losses of any of the major passenger carriers.





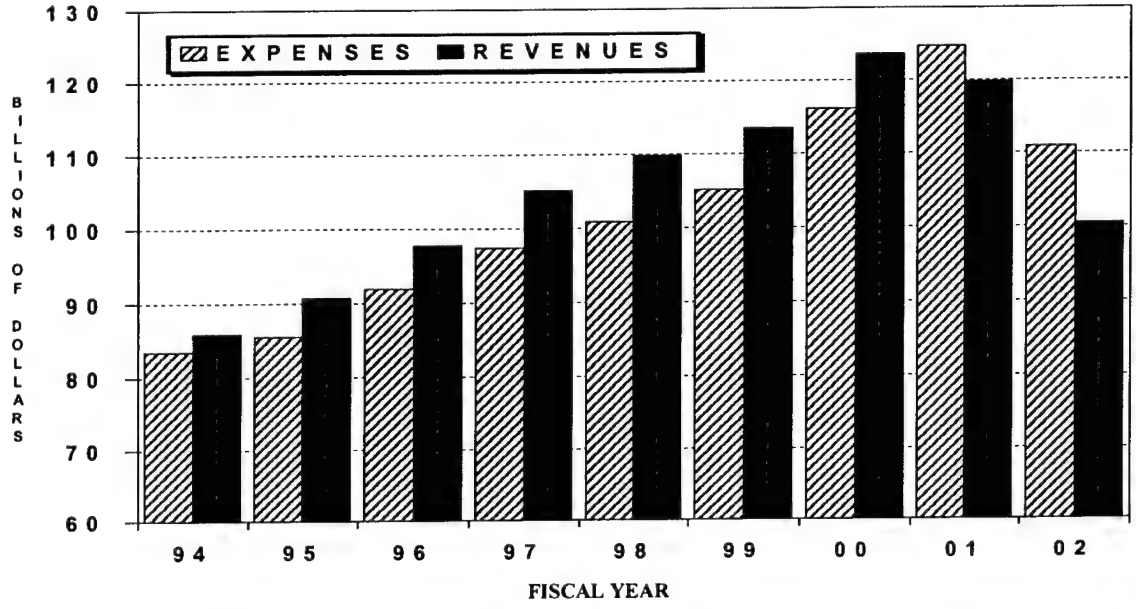
During the next few years, cost control will be key to the industry's ability to return to sustained profitability. Revenue will remain at low levels due to continued weak demand and increased competition from low fare carriers. Insurance costs, security enhancements, and fuel costs are expected to increase and further widen the gap between revenues and costs. In the long run, revenues rise through a combination of higher yields and economic growth expanding activity.

[2] Operating cost comparisons may be skewed by individual carrier accounting practices regarding the treatment of writedowns of equipment following September 11th attacks.

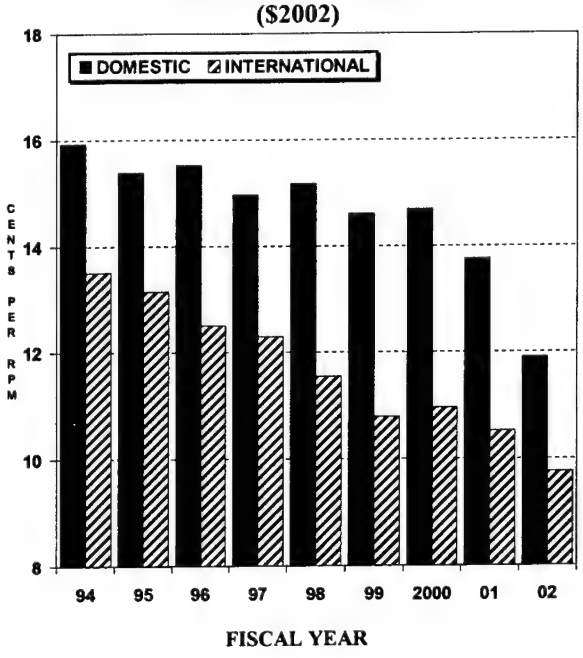
[3] A Major carrier by definition is one that has annual operating revenues in excess of $1B. American Eagle, considered a regional carrier, has been excluded from this analysis.

U.S. COMMERCIAL AIR CARRIERS: REVENUE AND COST TRENDS

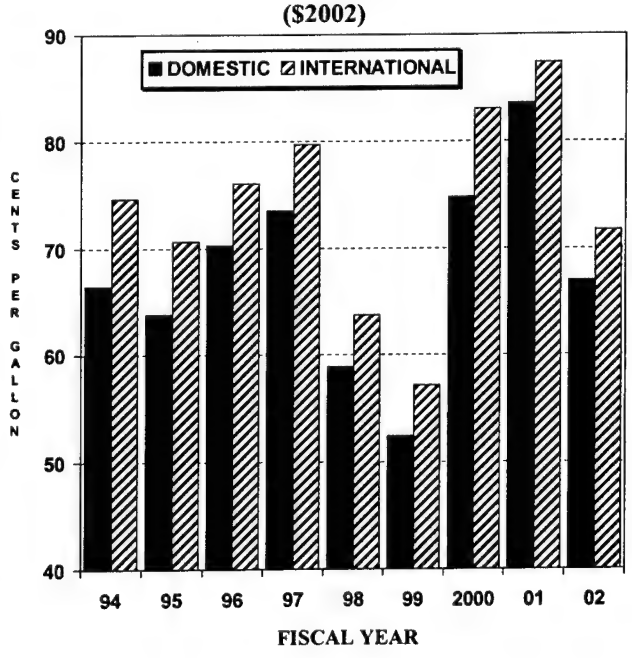
OPERATING REVENUES AND EXPENSES
(CURRENT DOLLARS)



PASSENGER YIELDS
($2002)



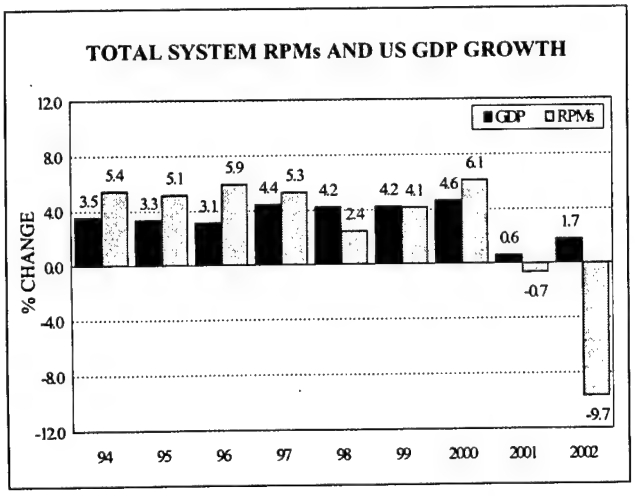
JET FUEL PRICES
($2002)



Costs will increase with higher outlays for security enhancements and infrastructure improvements. The industry will need to lower its non-security and infrastructure related costs in order to return and sustain profitability throughout the forecast period.

SCHEDULED PASSENGER TRAFFIC AND CAPACITY

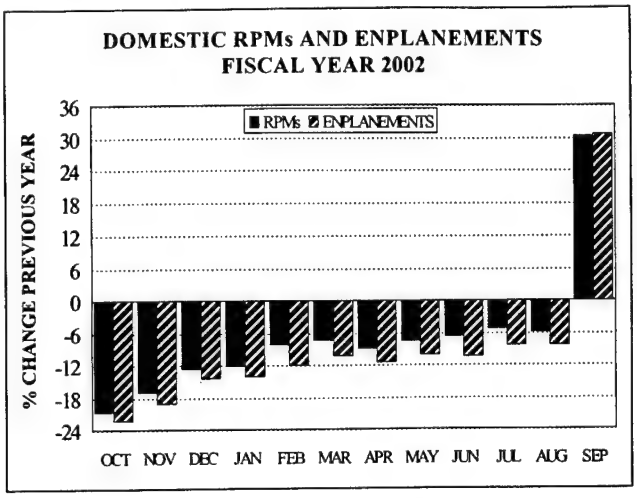
In 2002, total (domestic plus international) scheduled U.S. large carrier revenue passenger miles (RPMs) declined an unprecedented 9.7 percent. Enplanements also decreased, falling 10.5 percent. Since 2000, system RPMs have decreased by 10.4 percent, despite a 2.3% increase in real U.S. Gross Domestic Product (GDP).

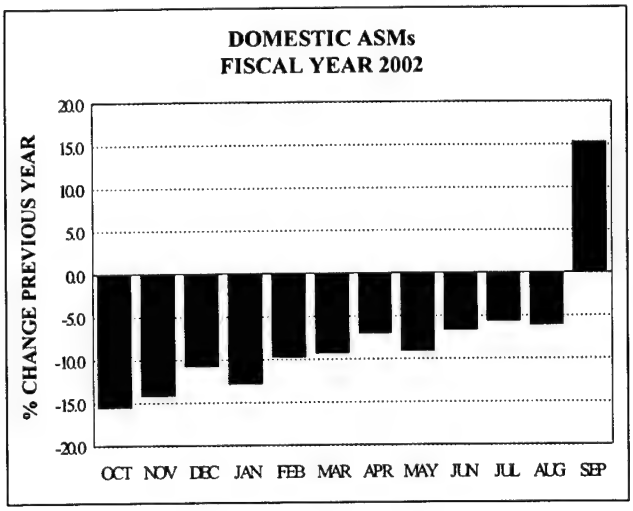


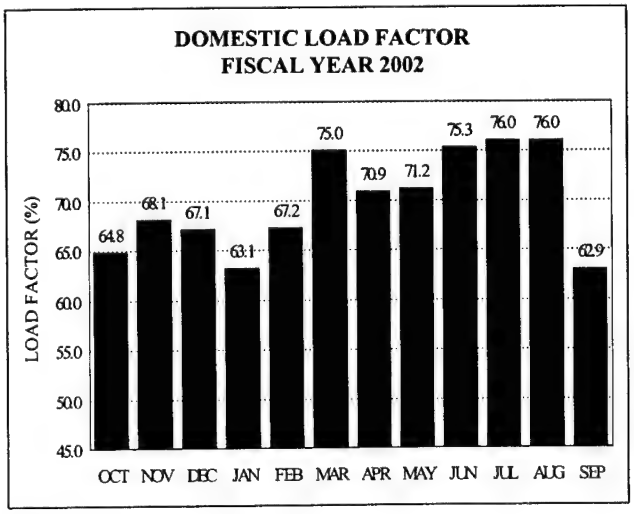
System available seat miles (ASMs) decreased 9.8 percent in 2002, the largest decrease ever. System load factor remained constant at 71.2 percent.

Domestic Passenger Traffic and Capacity

In 2002 the fall in demand following the September 11th attacks, coupled with a soft economy, resulted in RPMs falling 8.3 percent and enplanements 10.5 percent. Traffic declines were largest in the first quarter and then diminished throughout the balance of the year. Despite capacity shrinking by 8.4 percent, the load factor remained steady at 70.0 percent.

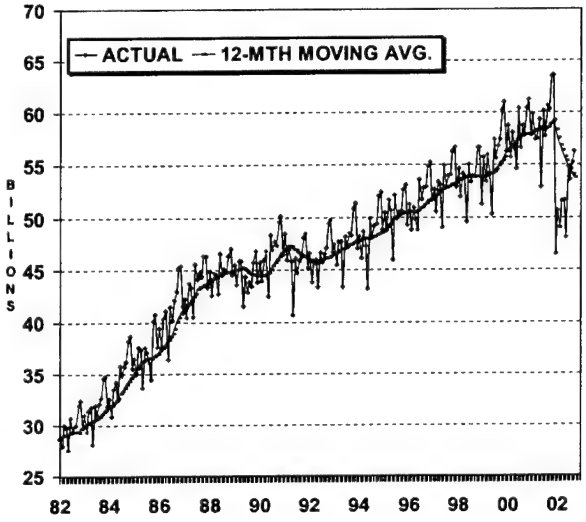






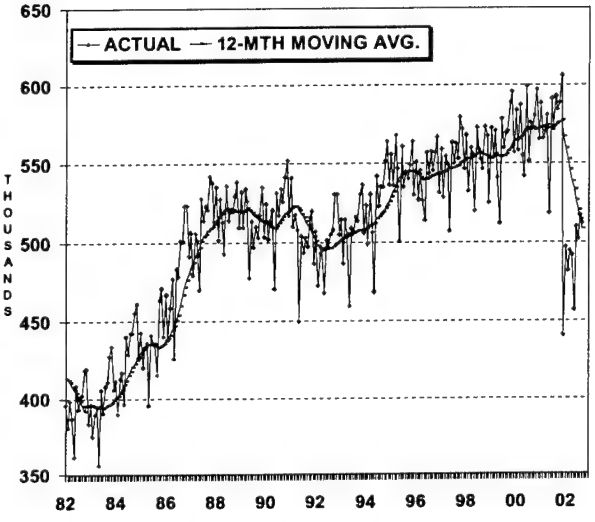
U.S. AIR CARRIER DOMESTIC TRAFFIC TRENDS
(Data through June 02)

AVAILABLE SEAT MILES



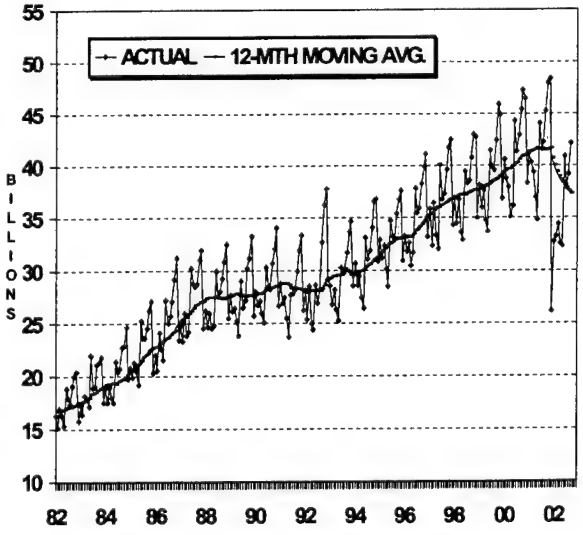
FISCAL YEAR BY MONTH

AIRCRAFT DEPARTURES



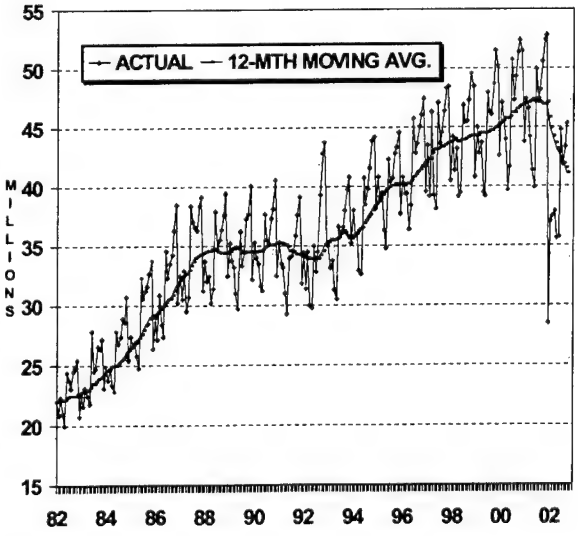
FISCAL YEAR BY MONTH

REVENUE PASSENGER MILES



FISCAL YEAR BY MONTH

ENPLANEMENTS



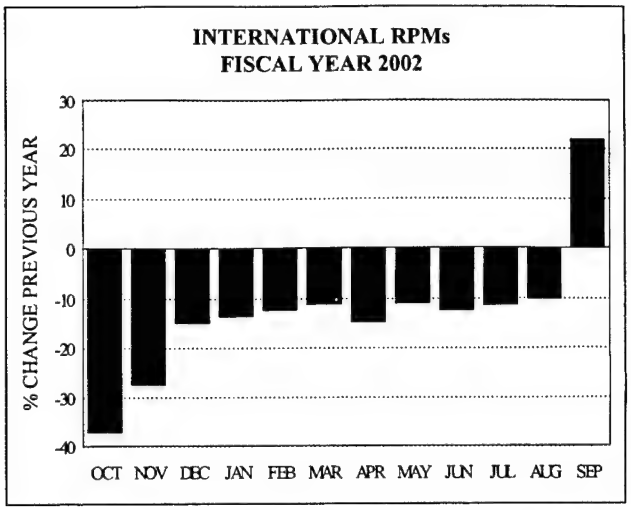
FISCAL YEAR BY MONTH

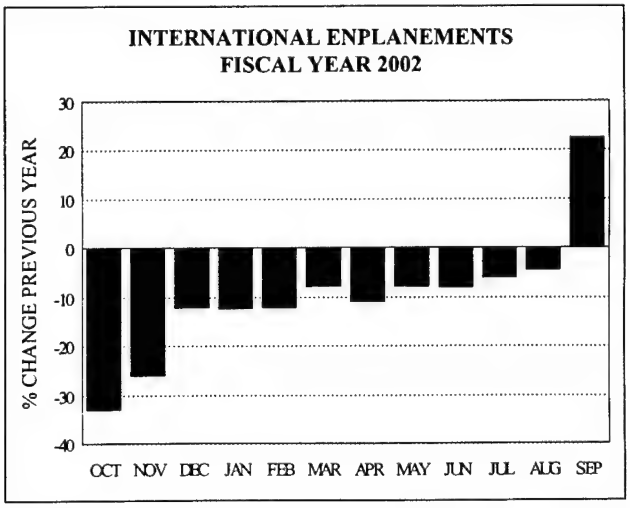
U.S. Large Air Carriers' International Passenger Traffic and Capacity

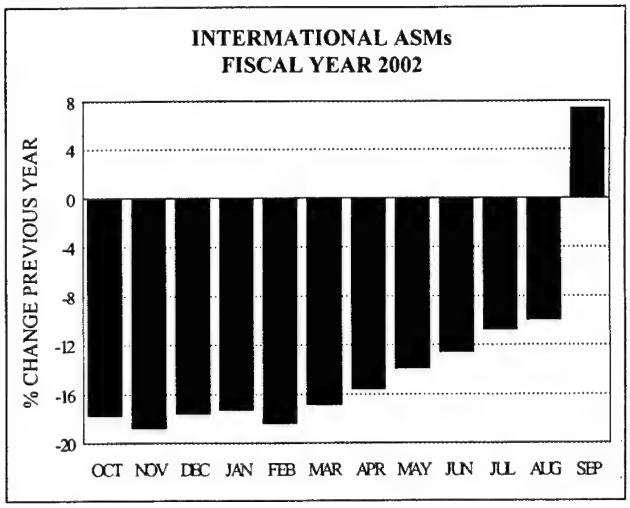
A steep decline in demand following the September 11th attacks coupled with weak world and U.S. economic growth resulted in total U.S. large carrier international traffic falling an unprecedented amount in 2002.

In 2002, total international RPMs decreased 13.5 percent, with RPMs recording their lowest level since 1996. Enplanements also decreased, though less than RPMs, down 10.1 percent. The decline in both RPMs and enplanements was more pronounced in the first half of the year as the immediate impacts of the September 11th attack and capacity reductions were felt. The second half of 2002 saw year-over-year declines of about 11 percent until September.

Total international ASMs fell 13.7 percent in 2002. The decline was sharpest in the first half of the year and diminished thereafter. Through the first 6 months of the year, capacity was down 17.7 percent, then decreased 14.4 percent in the 3rd quarter and fell 5.5 percent during the 4th quarter, which included the impacts of the September 11th attacks in 2001. Relative to 2000, international capacity was down 11.1 percent. Capacity declines in the Atlantic, Asia/Pacific, and Latin American markets were 13.9, 20.0, and 3.8 percent, respectively.

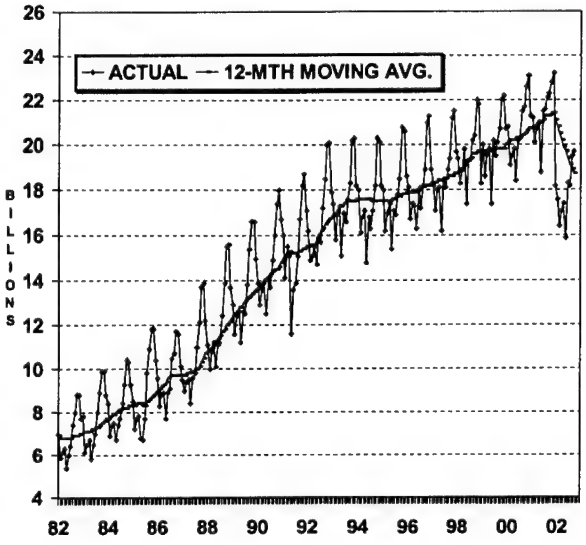






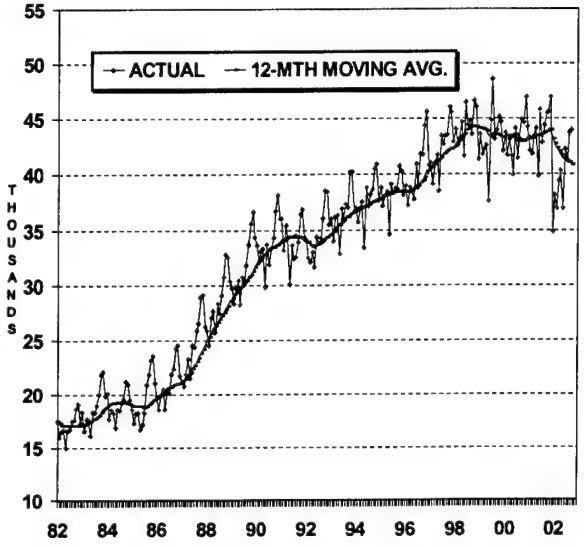
U.S. AIR CARRIER INTERNATIONAL TRAFFIC TRENDS (through June 02)

AVAILABLE SEAT MILES



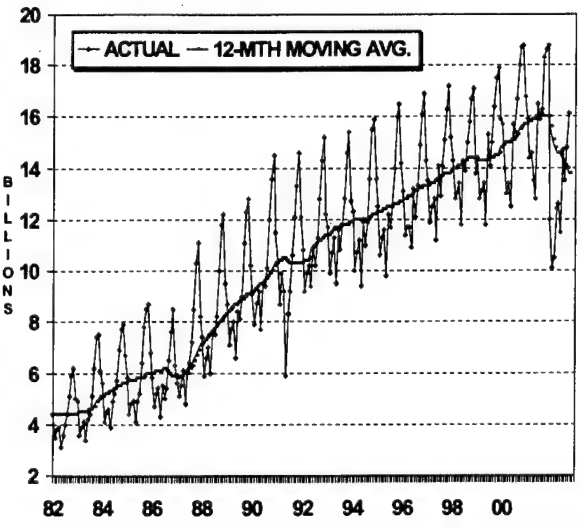
FISCAL YEAR BY MONTH

AIRCRAFT DEPARTURES



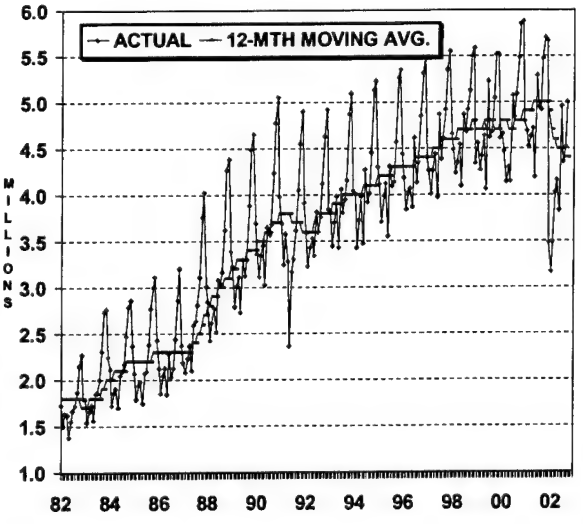
FISCAL YEAR BY MONTH

REVENUE PASSENGER MILES



FISCAL YEAR BY MONTH

ENPLANEMENTS



FISCAL YEAR BY MONTH

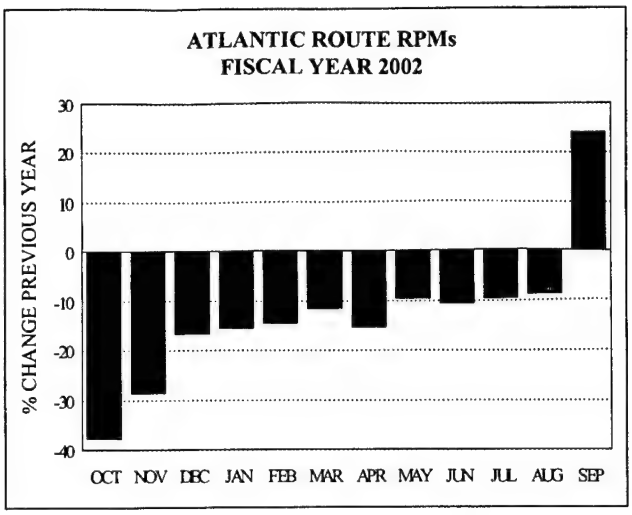
Atlantic Routes

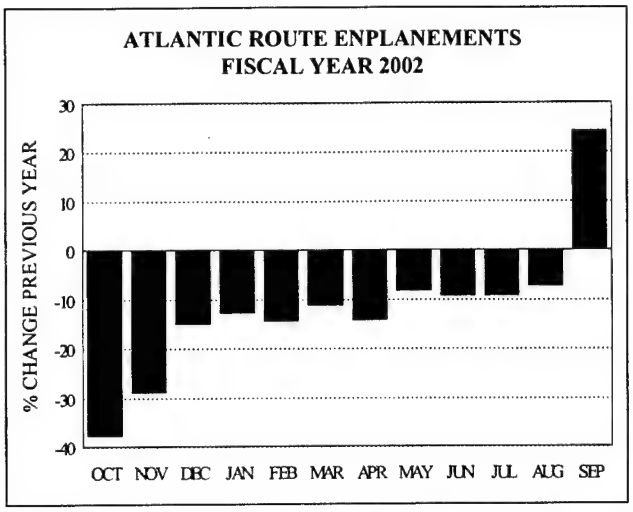
Transatlantic RPMs in 2002 declined for a 2nd consecutive year, the first time since 1974-1975. RPMs were down 13.2 percent from 86.2 billion to 74.8 billion. Enplanements fell slightly less, down 12.3 percent. Traffic decreases were greatest in October and November, immediately following the September 11th attacks. Compared to the same periods in 2001, traffic was down 15 percent from December through April, down 10 percent from May through August, before turning positive in September.

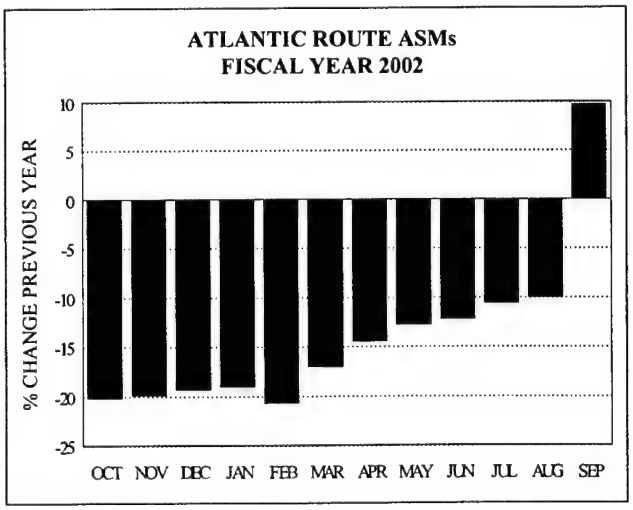
Capacity in Atlantic markets followed a similar pattern to traffic. The largest decreases were in the months immediately after the attacks, followed by a gradual return of flying throughout the winter and summer seasons. Capacity declined 13.9 percent for the year and the load factor increased 0.6 points to 77.0 percent.

Immigration and Naturalization Service (INS) data, which is compiled by the U.S. Department of Commerce, showed that in CY 2001 U.S. flag carriers' market share in the region increased for a 2nd consecutive year to 40.0 percent. This marks the first time since 1987-88 that U.S. flag carrier's market share has increased in consecutive years. U.S. flag carriers' market share peaked in 1988 at 48.5 percent.

In 2002 the U.S. passenger carriers had an operating loss of $771.8 million on routes in the market, a $467.4 million deterioration from the $304.5 million operating loss recorded in 2001. After recording 5 consecutive years of profits, U.S. passenger carriers have recorded losses the past 2 years. Weak demand associated with the September 11th terrorist attacks, was the primary factor behind the operating losses.

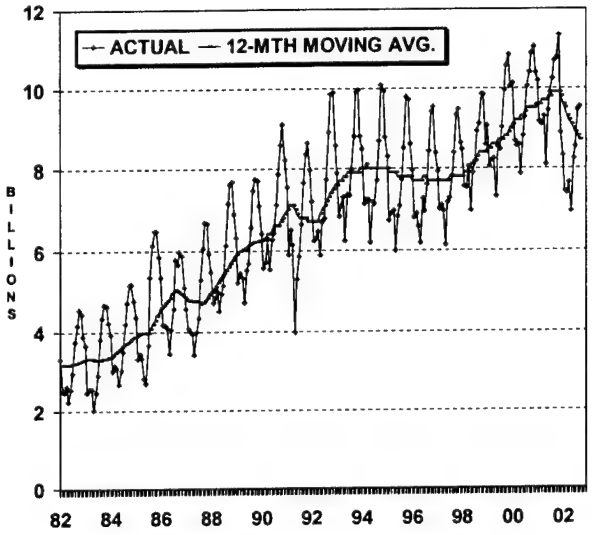






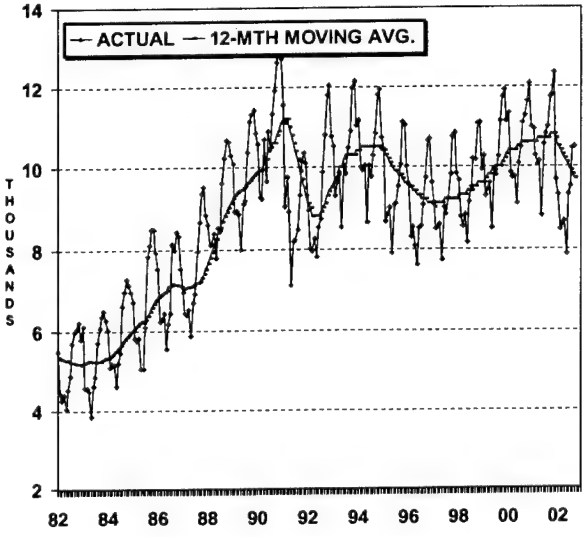
U.S. AIR CARRIER TRAFFIC TRENDS: ATLANTIC ROUTES (through Jun 2002)

AVAILABLE SEAT MILES



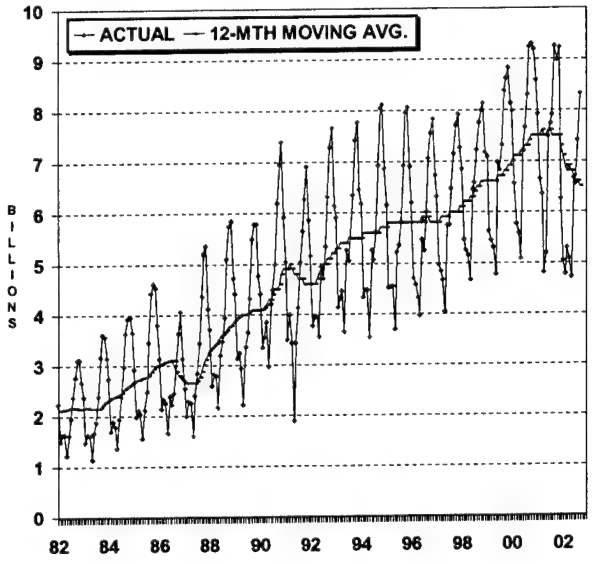
FISCAL YEAR BY MONTH

AIRCRAFT DEPARTURES



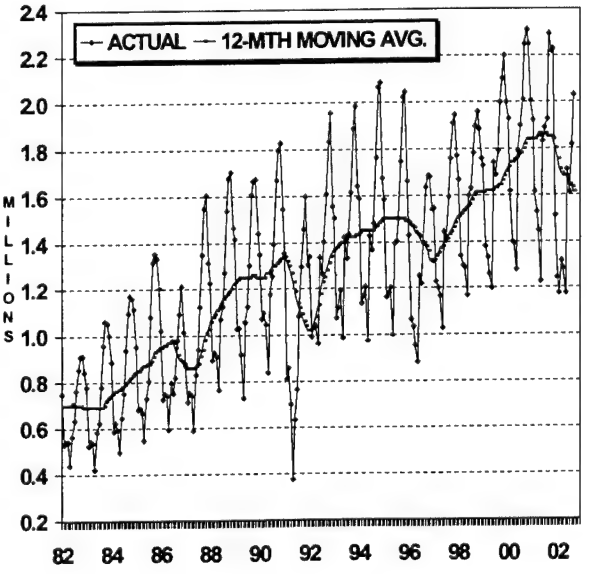
FISCAL YEAR BY MONTH

REVENUE PASSENGER MILES



FISCAL YEAR BY MONTH

ENPLANEMENTS



FISCAL YEAR BY MONTH

Latin American Routes

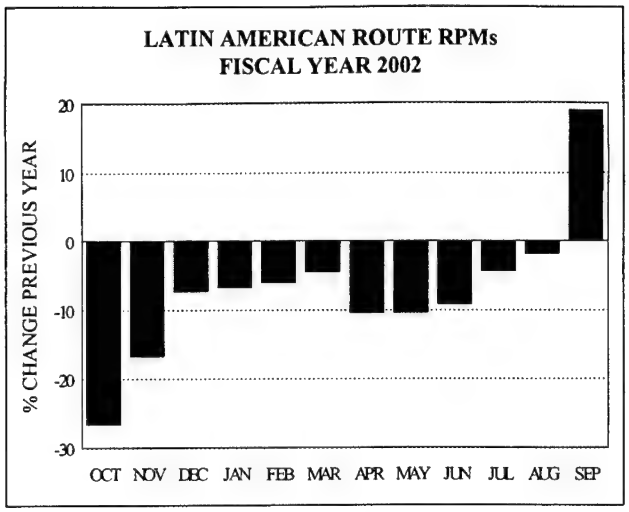
Traffic demand to Latin America (destinations in South America, Central America, Mexico, and the Caribbean) fell in 2002, although less than other international markets. In 2002, RPMs and passenger enplanements were down 7.5 and 3.6 percent, respectively.

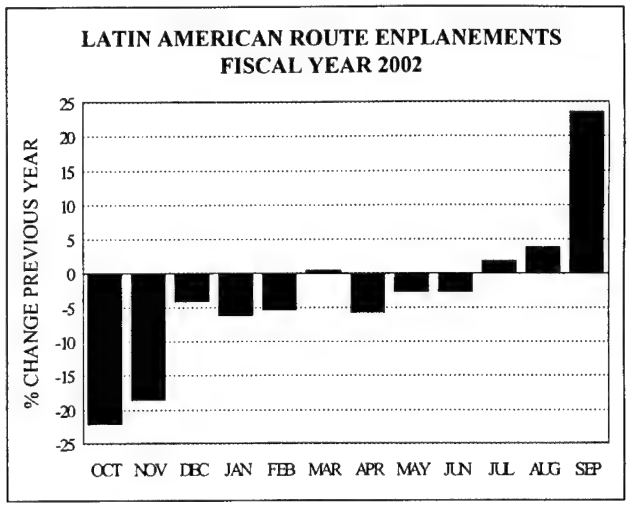
After declining an average of 20 percent in October and November, traffic on a year over year basis was down an average of 6.6 percent between December and August and then was up 18.8 percent in September. Capacity decreases were slightly less than traffic decreases until April and then were considerably less than traffic decreases, resulting in load factor decreasing to 66.5 percent—down 2.7 points from the 69.2 percent achieved in 2001.

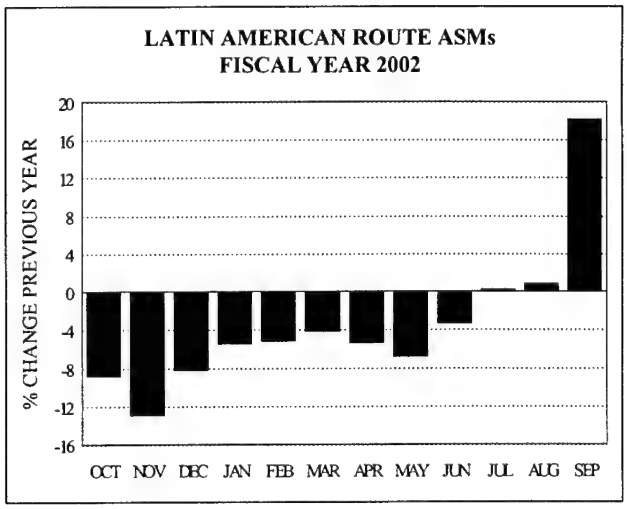
Reversing a decade long trend, the average trip length decreased 4.1 percent (68.7 miles) in 2002, as carriers pulled back from the deep South American (Argentina, Brazil, Chile) markets and expanded into Caribbean markets. Despite the fall in trip length in 2002, since 1991 the average trip length has increased by 27.2 percent, or 346.6 miles, rising from 1,272.6 to 1,619.2 miles.

The U.S. passenger carriers had an operating loss of $448.7 million in Latin markets in 2002, a $489.6 million swing from the $40.9 million operating profit in 2001.

The events of September 11th are having major impacts on carriers in the region. Latin American carriers, like their U.S. counterparts, are focused on survival. As regional demand recovers to more normal levels, efforts to privatize and restructure Latin American carriers will accelerate. Clearly, these industry changes, along with the move towards open-skies agreements, will pose additional challenges for the U.S. carriers over the next several years.

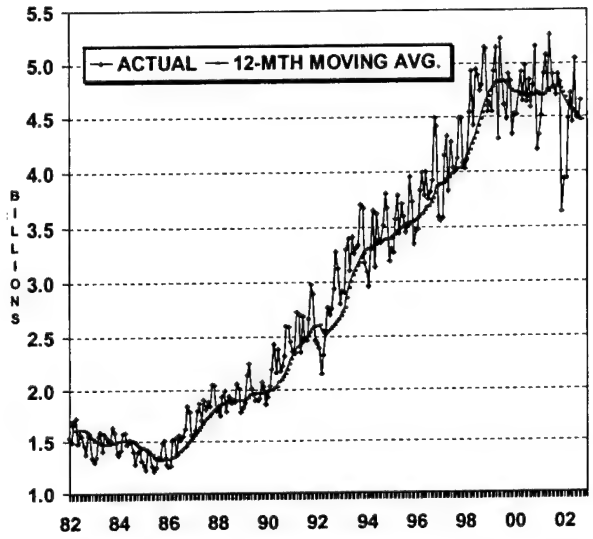






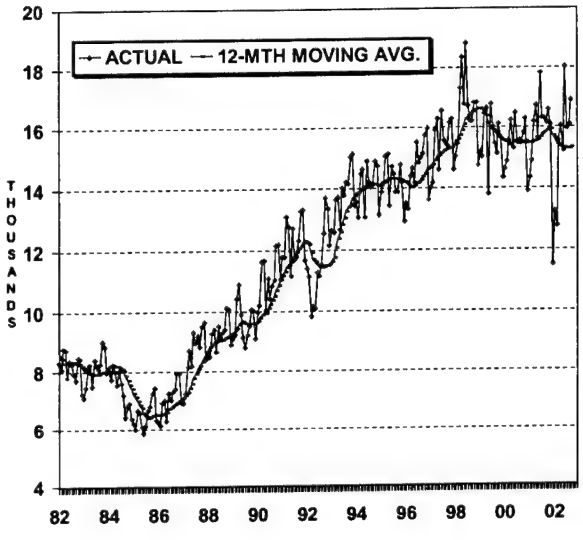
U.S. AIR CARRIER TRAFFIC TRENDS: LATIN AMERICAN ROUTES (through June 2002)

AVAILABLE SEAT MILES



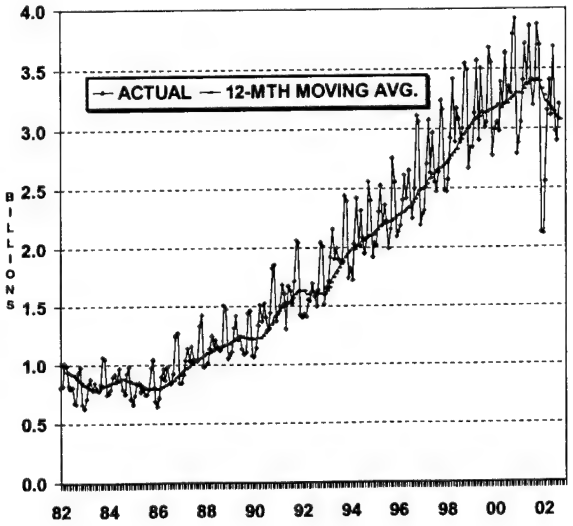
FISCAL YEAR BY MONTH

AIRCRAFT DEPARTURES



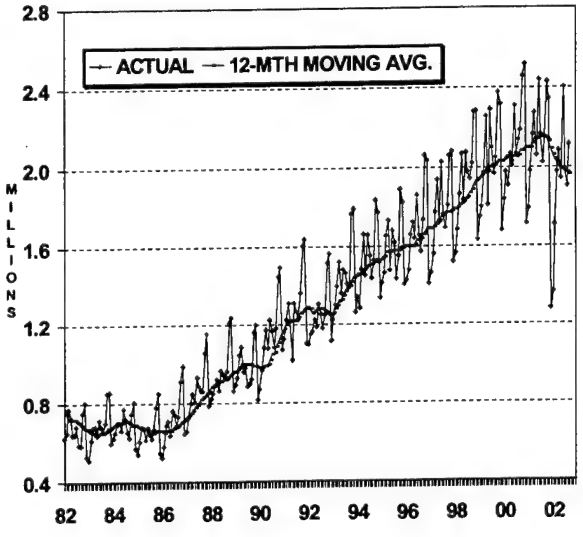
FISCAL YEAR BY MONTH

REVENUE PASSENGER MILES



FISCAL YEAR BY MONTH

ENPLANEMENTS



FISCAL YEAR BY MONTH

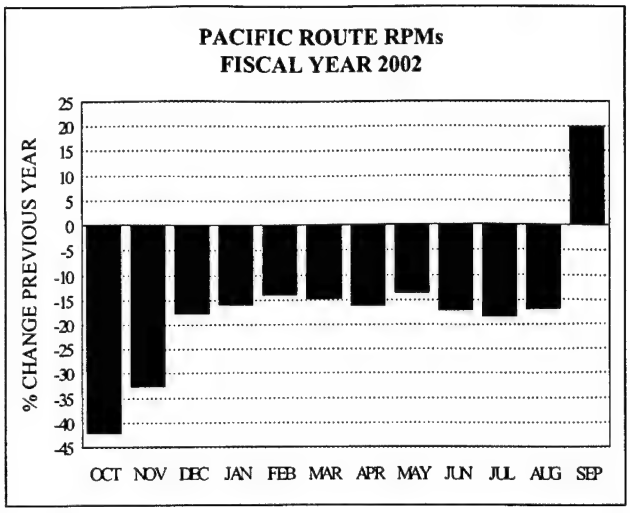
Pacific Routes

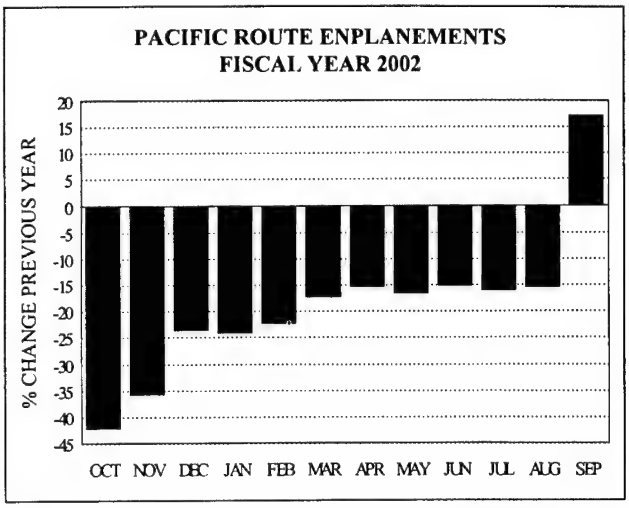
Traffic in Asia/Pacific markets decreased sharply in 2002, with RPMs down 17.6 percent compared to 2001. Following declines of 42 and 33 percent in October and November respectively, traffic declines ranged between 14 and 19 percent for the balance of the year until September. Enplanements also declined sharply, down 18.7 percent.

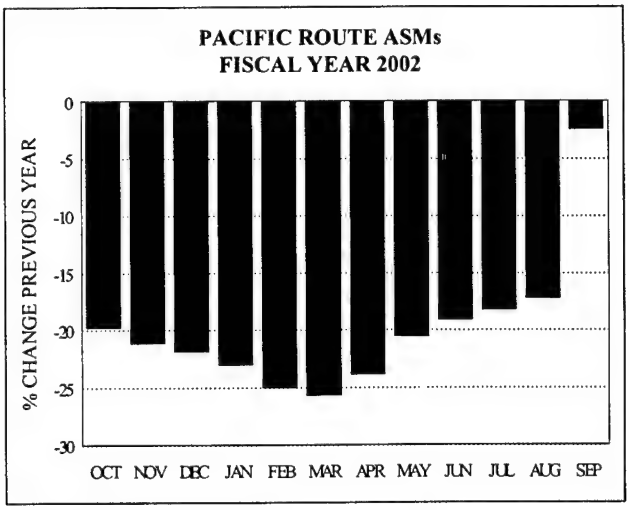
U.S. flag carrier ASMs decreased by 20 percent as carriers cut capacity to the region following the September 11th attacks. ASMs were down in every month of the year. The load factor for the region was up 2.3 percentage points to 77.5 percent. Load factor was down in October and November and was up for most months thereafter.

Large declines in both traffic and yields resulted in large operating losses for U.S. passenger carriers in the Pacific market. Following an operating loss of $661.8 million in 2001, U.S. passenger carriers recorded an operating loss of $735.5 million in 2002 in the market.

In the near-term, restructuring of the Pacific market, prompted by the September 11th attacks continues as carriers consolidate routes, rationalize fleets, and even merge. Over the long-term the survivors of the market changes should benefit from open-skies agreements reached with Malaysia, New Zealand, Taiwan, Singapore, Brunei, and Korea, as well as liberal bilateral agreements with Japan and China. These agreements will stimulate aviation growth by providing travelers with service to more cities and lower fares.

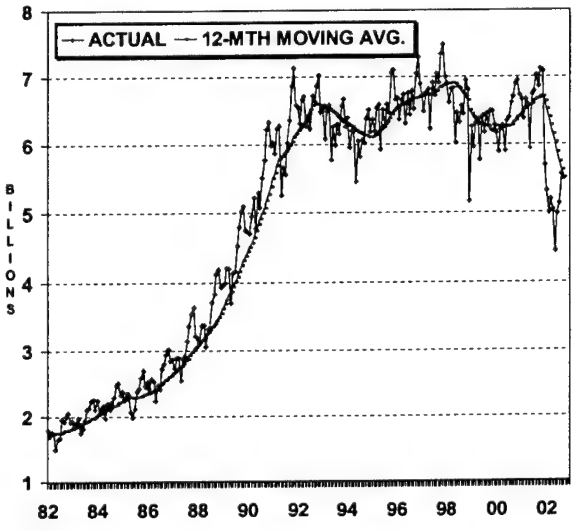






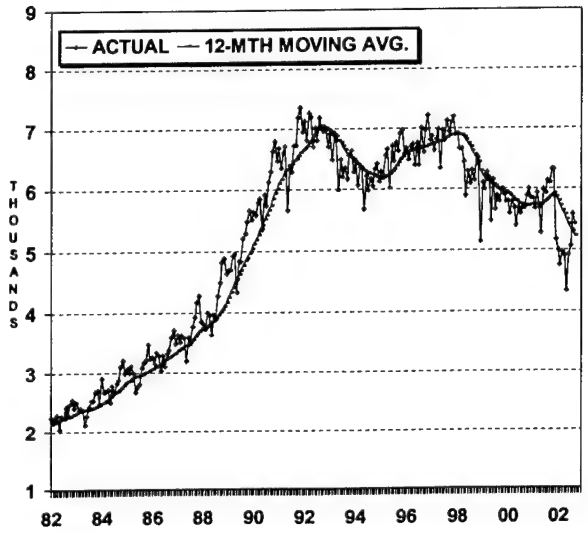
U.S. AIR CARRIER TRAFFIC TRENDS: PACIFIC ROUTES (through June 2002)

AVAILABLE SEAT MILES



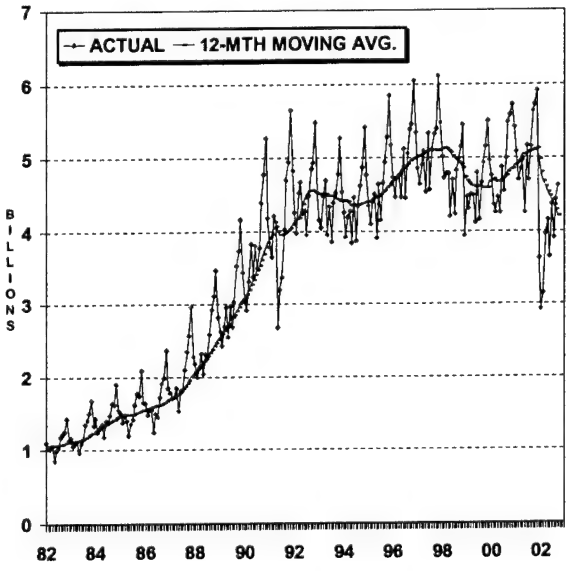
FISCAL YEAR BY MONTH

AIRCRAFT DEPARTURES



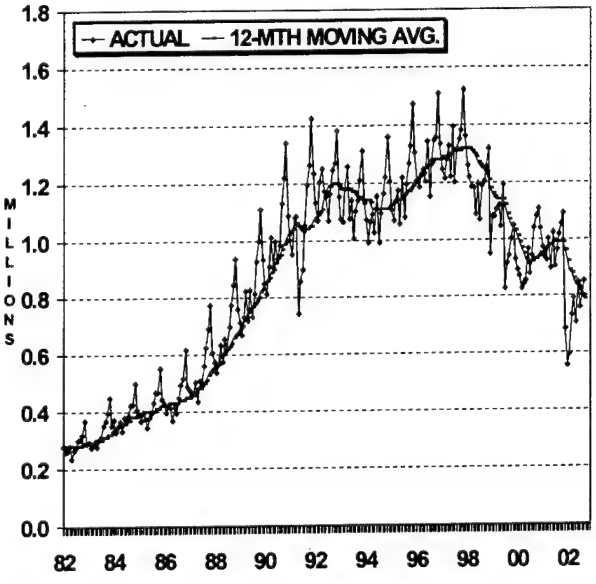
FISCAL YEAR BY MONTH

REVENUE PASSENGER MILES



FISCAL YEAR BY MONTH

ENPLANEMENTS



FISCAL YEAR BY MONTH

NONSCHEDULED TRAFFIC AND CAPACITY

The number of nonscheduled (charter) passengers flying on U.S. commercial air carriers fell an estimated 9.2 percent in 2002, to a total of 8.3 million. Domestic enplanements declined 11.3 percent, while international enplanements decreased 6.8 percent. Nonscheduled RPMs declined 2.7 percent while ASMs increased 6.2 percent, which resulted in a decline in the load factor from 68.3 to 62.5 percent.

AIR CARGO TRAFFIC

U.S. air carriers flew 27.3 billion revenue ton miles (RTMs) in 2002, down 4.0 percent from 2001. Domestic cargo RTMs (13.1 billion) were down 5.9 percent, while international RTMs (14.2 billion) decreased 2.2 percent. These declines reflect the slow domestic and worldwide economic growth in 2002.

Air cargo RTMs flown by all-cargo carriers were 63.4 percent of total RTMs in 2002; passenger carriers flew the remainder, or 36.6 percent of the total. Total RTMs flown by all-cargo carriers decreased 0.2 percent in 2002, from 17.4 billion to 17.3 billion. Total RTMs flown by passenger carriers were 10.0 billion in 2002 (down 10.0 percent). The larger decline by passenger carriers relative to all-cargo carriers is due to the reduction in schedules of the passenger carriers as well as the new FAA security directive.

INDUSTRY STRUCTURE AND RISK

The present forecasts (2003 to 2014) are based upon a set of assumptions concerning changes in the economy, structural changes in the air carrier industry, and changes in the market for air transportation. The probability of achieving these forecasts depends on realizing the economic projections discussed in Chapter II and industry assumptions discussed in the following section.

STRUCTURAL CHANGES

Significant structural changes in both domestic and international markets were underway well before the September 11th attacks. These have intensified competition and moved carriers to increase efficiency and productivity, reduce operating costs, and lower fares. The events of September 11th accelerated the pace of these changes. In addition, with approximately 25 percent of industry capacity mired in bankruptcy, the potential for significant structural change is as high as it has been since deregulation of the industry.

Encouraged by the financial success of Southwest Airlines, large profit margins on many routes, and the weakened financial condition of many of the larger network carriers, low-cost carriers are expanding rapidly in the domestic market. The benefits to the American consumer brought about by low-cost, low-fare airlines have been substantial and are well documented. Low cost, low-fare carriers such as Southwest, JetBlue, Airtran, and Frontier have added routes and planes, even while the larger network carriers have been cutting routes and shrinking their fleets. In FY 2002, Jet Blue initiated service at Washington-Dulles and Long Beach, while Airtran launched service out of

Baltimore. The expansion of these low-cost, low-fare carriers will help to ensure that competitive forces remain strong in the industry.

With net losses approaching $10 billion in FY 2002, network carriers are under intense pressure to reduce their unit costs. These carriers have responded by reducing employees and employee wages, eliminating unprofitable routes or transferring those routes to aligned commuter carriers, seeking work rule changes, deferring aircraft deliveries, and adjusting schedules at key hubs to smooth out the flow of departures and arrivals. In the aftermath of the terrorist attacks on September 11th, U.S. carriers announced employee reductions totaling more than 91,000 and the retirement of more than 400 aircraft by April 2002. Despite these measures, losses have continued and two carriers, United and US Airways, are operating in Chapter 11 bankruptcy. In addition, Delta has recently announced the relaunching of a low fare subsidiary airline in order to stem the increase in market share by the low fare carriers. Delta expects the unit costs of the subsidiary to be competitive with the low fare carriers primarily through higher utilization and flexibility in work rules. Other carriers such as American, are struggling with ways to reduce their costs in order to stay competitive. In addition, almost all of the major carriers have negotiated or are negotiating with aircraft manufacturers to modify delivery schedules in 2003-04.

While network carriers seek ways to reduce their unit costs, many obstacles exist which will make their task more difficult. Labor costs, which constitute the largest share of operating expenses, will be a prime target for airline management cost reduction plans. Organized labor is reluctant to give up gains in pay and benefits it has achieved in the past few years. The United pilots' agreement, reached in August 2000, after months of difficult negotiations, became the catalyst for higher wage demands and/or renewed labor unrest. Shortly after the United pilots' agreement was reached, pilots at Delta and mechanics at Northwest received contracts that contained significant wage increases. In FY 2002, United reached an agreement with its mechanics that provided for a significant increase in wages. Many analysts are waiting to see if the bankruptcy filings of US Airways and United will set the stage for a round of labor cost reductions throughout the industry. US Airways has been successful in negotiating sizeable wage concessions with its employee groups and it is assumed that United will realize similar labor cost reductions, setting the stage for their emergence from bankruptcy as lower cost competitors. Their success in achieving labor cost reductions will increase the pressure on the other major network carriers (American, Continental, Delta, and Northwest) to reduce their labor costs in order to stay competitive. However, it to be seen if the current financial turmoil will serve as a catalyst for an industry-wide moderation in wage and benefit growth or even industry-wide wage reductions.

Another obstacle that carriers are facing is union resistance to their plans to accelerate the transfer of routes from network carriers to their regional affiliates. The reduction in demand following September 11th has spurred efforts by the network carriers to make these changes and has weakened resistance of labor groups (particularly pilots) to such plans. However many of the labor contracts that network carriers have negotiated place limits on the number of regional aircraft that can be substituted for mainline aircraft. With the rapid transfer of routes from network carriers to regional affiliates, many network carriers are bumping up against these limits. In addition, once demand recovers, it remains to be seen if the network carriers will seek to reverse these route transfers. For now, the transferring of routes is occurring at a rapid pace. During the past year, US Airways, Delta, Northwest, American, and United have announced the shifting of numerous routes from the mainline carrier to their regional affiliates.

Network carriers have also expanded their domestic code-share alliances in an attempt to increase revenues. In recent months the U.S. Department of Transportation has conditionally approved both the United-US Airways and Continental/Delta/Northwest domestic code share agreements. By agreeing to code share, the carriers hope to increase revenues by gaining access to new passengers through the network of their code share partner(s). The carriers argued that these agreements would benefit consumers by offering on-line service to travelers in markets that do not have such service, as well as improved access to frequent flyer programs and airport lounges. Opponents of the code share agreements were concerned about the anti-competitive nature of such agreements including the potential for collusion on pricing and the impacts of dominant combined market share at key cities and the resulting detrimental effects on entry by competitors.[4] Measured in terms of RPMs, the code-share agreements involve carriers that have almost 60 percent of the domestic market. American, which is the only large network carrier not involved in a domestic code share agreement, will most likely lose some market share. In addition, the growth in market share of the low cost/low fare carriers may slow as these carriers may not start service in markets that are dominated by the alliances or abandon some markets in the face of competition from the alliances.

With United in bankruptcy, the possibility exists for the most significant change in international markets since the sale of the Pan Am and TWA Atlantic route networks in the late 1980's. Many believe that to satisfy the demands of its creditors, United will have to sell assets. Carriers such as American, Delta, or Northwest could gain access to new markets and introduce new competition. In addition, international markets have historically been subject to a series of bilateral agreements. Such agreements, which started back in the 1940s, have severely restricted competition. History has demonstrated that competition improves efficiency, productivity, and worldwide economic growth. At the present time, DOT is attempting to create a more competitive international aviation environment for the U.S. airlines through the expansion of open-skies agreements.

Discussions concerning the liberalization of markets are proceeding with other countries throughout the world. However, the recent ruling by the European Court of Appeals, which essentially voids open skies agreements that have been negotiated with individual countries within the European Union, has prompted a great deal of uncertainty as to the future of open skies. Prior to the ruling, the US and Great Britain had held discussions about an open-skies agreement. Ultimately the discussions went nowhere as the U.S. rejected a proposed alliance between British Airways (BA) and American Airlines (AA). While many would have liked an open-skies agreement, the "price" (approval of the AA/BA alliance) proved too steep for the airlines involved. The expansion of "open skies" agreements over the next several years could significantly increase the level of activity of the more efficient U.S. carriers vis-à-vis foreign flag carriers.

The industry is expected to continue toward globalization, through the use of code-sharing agreements and alliances. Four large alliances have formed and continue to seek members and add network connections. The four are SkyTeam (Delta-Air France), Star Alliance (United-Lufthansa), Oneworld (American-British Airways), and Northwest-KLM. The alliances have been able to reduce costs through economies of scale. They have also increased revenues and passenger traffic by expanding the reach of the networks and providing seamless travel for their passengers.

[4] On January 21, 2003 the U.S. DOT began an enforcement action against Continental/Delta/Northwest to block implementation of their proposed agreement after the carriers rejected key provisions of DOT's conditional approval.

To summarize, the industry is dynamic, but faces a period of great uncertainty in the aftermath of the September 11th attacks and the bankruptcy of United and US Airways. Some trends that were taking place prior to September 11th will be accelerated, while others will not proceed as rapidly as before. The outcome could fundamentally alter the structure of the industry. Although some of these changes could result in decreased short-term demand, in the long run the net effect will be and reduced unit costs and fares, increased air carrier efficiency, and increased demand for air travel.

MARKET CHANGES

While September 11, 2001 was a watershed date in aviation, a number of important trends were occurring in the industry prior to that date and are expected to continue although the pace may be slowed as the industry adjusts to a new reality. Among these are: 1) the ability of air carriers to more closely adjust the number of discounted seats to maximize revenues and profits; 2) the growth of competition by low-cost carriers; 3) increased numbers of routes being transferred from mainline to regional operators; 4) increased efficiency and productivity; and 5) declining real fares. In the near-term, the increased time and cost of new security measures will offset some of the benefits of the trends mentioned above. In addition, the reduced propensity to fly by both business and leisure passengers will diminish some of the benefits. However, given the precarious financial condition of the industry, labor may be more accommodating in wage negotiations. In the long run we see the cost of business travel falling, reducing the sensitivity of business travelers to the cost of air trips. It is anticipated that short-haul markets will see a rebound in traffic with improvements in security processing times. It is also expected that consumers will continue to prefer pleasure travel by air versus other modes and a long-term expansion of the economy.

Business demand for air travel has become more price elastic for three reasons. First is the increase in the availability of substitutes. Not only has new technology, such as videoconferencing, expanded rapidly and become more widely accepted but also the development of more productive and efficient corporate aircraft (fractional ownership for example) has given business travelers more choices than previously. Second, concerns over security have reduced the propensity of business travel, especially over shorter distances. Since the September 11th attacks, the advantages of air travel versus other modes of transport for short-haul travel has been reduced due to concerns over security as well as the increased processing time. For shorter haul trips this processing time is a significant percentage of the total travel time and as this percentage increases, more business travelers will use substitutes. It remains to be seen whether this becomes a long run trend or dissipates. Third, as the relative price of business travel increased vis-a-vis discounted travel, business travelers became more tolerant of the conditions of discounted travel (advance purchase, Saturday night stays, etc.) in order to qualify for the discounts.

In the future, we believe that business travelers will see some relief from the skyrocketing cost of business travel. With successful cost restructuring and the resulting lower cost structures, carriers will be able to offer lower business fares. In addition, improved internet search engines will allow business travelers more efficient ways to search and find low fares.

The demand for leisure travel increased during the 1990s because of increasing consumer preference for air travel, increasing disposable income, expanding personal wealth, and lower relative fares. The 1998 Air Travel Survey conducted by the Air Transport Association of America showed that the percent of individuals who have ever flown increased from 74 percent

in 1990 to 81 percent in 1997. Despite the events of September 11th, the trends mentioned above are expected to lead to a continued increase in the demand for leisure travel.

It was clear that in the immediate aftermath of the events of September 11th, the public's propensity to fly was reduced. Despite the fact that more than a year has passed, it is too soon to tell if the reduction has become permanent. It is also evident that demand has not rebounded in the way that many analysts thought. However, it remains to be seen whether the modest recovery in demand forecast is indeed due to a permanent shift in the propensity to fly, or some other reason. If the reduction is indeed permanent, then the future growth in demand may not approach historic levels even with vigorous economic growth.

While the relative price of flying has decreased consistently since deregulation, the airline industry has, for the most part, been profitable, albeit marginally. However, the events of September 11th and the ensuing financial turmoil has resulted in fewer airlines, diminished productivity (at least temporarily), and record losses. Adding to carrier woes, the increase in the amount of taxes and fees added to the ticket price in the past few years has widened the gap between what customers pay and the revenue the airlines receive. The industry has been lobbying very hard for tax relief to help it return to profitability. One area debated is who should pay the increased cost of security in the post September 11th world. The airlines argue that such functions are the responsibility of the federal government and as such the costs should be borne by the government. In addition, removal of the security fee would provide a measure of tax relief that the industry is seeking. The government position is that the users of the system should bear part of the increased security costs. Should the government position prevail in the long run, the associated costs to both the airlines and consumers would reduce demand. It is not clear that future productivity increases, capacity growth, and competition will be sufficient to keep relative fares declining. These market conditions would make it difficult for the industry to achieve acceptable rates of return on capital.

GLOBAL RISKS AND UNCERTAINTIES

The forecasts of scheduled commercial air carrier demand are based on a specific set of assumptions concerning economic growth in the United States and abroad, the political environment in which they will take place, Government tax policy, and changes in industry structure. The uncertainties surrounding these assumptions are larger than in prior forecasts and could cause outcomes to be significantly different from those forecast. Developments that could alter the forecasts include:

- additional terrorist attacks utilizing commercial aircraft in the U.S. or abroad;
- war with Iraq;
- the impact of regional jets;
- the impact of additional security measures on costs and travel convenience;
- the continued recovery of consumer confidence in flying commercial airlines;
- the strength and speed that the United States and world economies emerge from recession;
- the number of business cycles that occur over the forecast period;
- the movement of future oil prices;

- the degree of competition in both the domestic and international markets;
- the potential for consolidation within the industry;
- how far carriers can reduce unit costs;
- how fast yields decline due to increased competition and cost reductions.

In addition, the network of bilateral pacts that the United States currently has in place in Europe, the Far East, and South America could significantly inhibit the expansion plans of air carriers operating in these international regions and restrain traffic growth. On the other hand, the move towards deregulation, privatization of national carriers, and expansion of open-skies agreements could result in significantly greater traffic growth.

DOMESTIC TRAFFIC: ASSUMPTIONS, MODELS AND FORECASTS

During the past several years the FAA has adopted a decision-theoretic forecasting system. The approach is generally accomplished in two stages. Initially, projections are made with the use of econometric and time series models. The model equations and outcomes are then adjusted based upon "expert industry opinion" to arrive at subsequent forecasts for use in the decision-making process. As was done last year, near term forecasts (those for 2003 and 2004) have been developed utilizing a set of assumptions regarding capacity and expert judgment as to the degree and timing of the industry recovery from the events of September 11th. Forecasts for the years 2005 and beyond were based on results derived from the models described below.

In developing the short-run demand forecasts it was assumed that: 1) no new terror attacks against U.S. airlines will occur; and 2) U.S. large carriers will not reach pre-September 11th levels of capacity until 2005. The key assumption of the long-run demand forecasts is that the historic relationship between demand and economic growth has not been permanently impacted by the events of September 11th and will resume by 2005. In addition, it was assumed for the long-run demand forecasts that: 1) industry improvements in efficiency and productivity continue but at less than historical rates; 2) taxes and fees on airline tickets remain at current levels; 3) competitive forces remain strong; and 4) capacity is continuously adjusted so that demand and supply are in equilibrium.

Since models are relatively simple descriptions of very complex systems, they cannot account for all the political, social, psychological, and economic factors and their interactions that will lead to a particular set of outcomes. Therefore, it is essential to use judgment to account for the complexities of the operating environment. This can be accomplished by adjusting the exogenous variables, adjusting the model outputs, or revising the models initial parameter estimates.

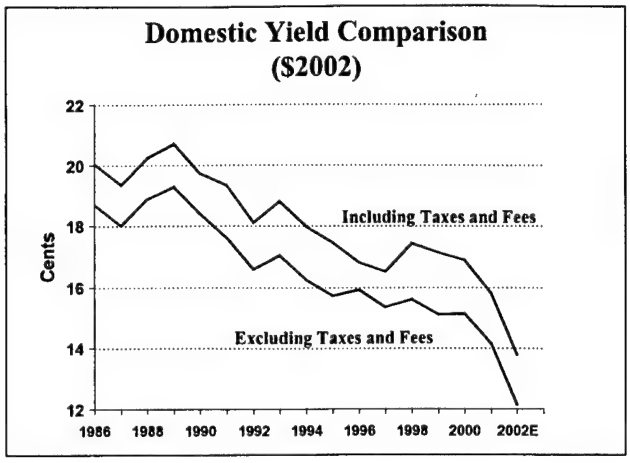
FAA periodically reviews and adjusts its projections based on forecasts and discussions with analysts outside FAA. Some important outside sources for adjusting FAA's projections are forecasts developed by: 1) the International Civil Aviation Organization's (ICAO) Asia/Pacific Area Traffic Forecasting Group (May 2002); 2) ICAO's North Atlantic Traffic Forecasting Group (May 2002); and 3) the National Academy of Sciences' Transportation Research Board Future Aviation Activities International Workshop (September 2002).

MODELING DOMESTIC RPMS AND ENPLANEMENTS

The model used to develop the FAA's domestic commercial air carrier forecasts relies upon a system of statistical and deterministic equations. The pivotal equations of the system relate RPMs and enplanements to two primary independent variables--GDP and yield--both adjusted for inflation. This analytical framework for forecasting enplanements ties the domestic forecast model closer to projected changes in economic activity and reduces the number of subjective inputs. This approach is expected to reduce the standard errors of the forecasts.

Market forces quickly took hold following deregulation of the industry in 1978. To adjust for the jointly dependent variables in the demand and supply equations, three-stage least squares is used to estimate the demand equations.

In recent years the amount of excise taxes and fees added on to the base price of a ticket has increased significantly and may influence the modal choice of travelers. In addition, as more and more consumers have access to low base fares, the percentage of the average ticket price that taxes and fees account for is increasing. For example, the $200 round trip ticket to Florida may actually cost the customer $250-$260 after all the taxes and fees are levied. If airline demand is becoming increasingly leisure oriented and price sensitive, ignoring the tax impacts on behavior may lead to an overestimation of the level of demand in the future. The traditional definition of yield does not include the amount of taxes that the consumer paid and may represent a misspecification of the price variable that should be used in models estimating aviation demand. In order to address this problem, the FAA has constructed a measure of yield that incorporates the tax and fees paid by consumers. Both yield series move in similar fashion over time but in recent years the gap between the two series has widened.



Although it is aggregate demand that we forecast, it would be preferable to use different models to estimate the two distinct components of each market--business and personal travel. A further refinement would distinguish the long-haul from the short-haul market. This approach would provide important information for developing public policy and would most likely improve the accuracy of the forecasts. Clearly, these markets are affected by different sets of variables, and adjust at different rates to them.

For example, most experts in the industry would agree that the price elasticity of demand for business travel differs from the price elasticity of demand for pleasure travel. Furthermore, theory would suggest that business profits are a factor in determining business travel, and that some measure of personal or family income is an important variable affecting pleasure travel.

At this time, however, the lack of an adequate database subdivided into these four components precludes the development of forecasts for each market at the national level. Additional research and data collection is necessary to advance this approach.

A more detailed description of the models used to estimate domestic traffic and yields can be found in Appendix A.

U.S. LARGE AIR CARRIER YIELD AND OPERATIONAL VARIABLES

Domestic Capacity

Between 1978 and 1990, domestic capacity grew an average of 5.5 percent annually, matching the growth of traffic during the same period. From 1991 through 1997, capacity grew 2.4 percent annually. During this period, the carriers developed the capability to rapidly adjust capacity to changing conditions in domestic demand while pushing up load factors. Following a capacity increase of almost 9 percent between 1998 and 2000, capacity grew 0.4 percent in 2001, and fell 8.4 percent in 2002. The decline in capacity for the first 3 quarters ranged between 7.7 to 13.6 percent. During the 4th quarter capacity was down only 1.1 percent, as the prior year levels were significantly impacted by the shutdown of U.S. airspace on September 11th and the subsequent capacity reductions instituted by carriers during the last 2 weeks of September.

In 2003, capacity is forecast to decrease 0.8 percent, as capacity reductions by the network carriers offset increases by the low fare carriers. In 2004, capacity is forecast to grow 3.3 percent driven primarily by higher utilization rather than fleet additions as carriers have deferred many deliveries of new aircraft until 2005 or beyond. For the balance of the forecast, domestic capacity is forecast to grow 3.2 percent a year. Over the 12-year forecast period, the average annual increase in domestic ASMs is forecast to be 2.9 percent, with domestic ASMs totaling 893.6 billion in 2014.

Passenger Yield

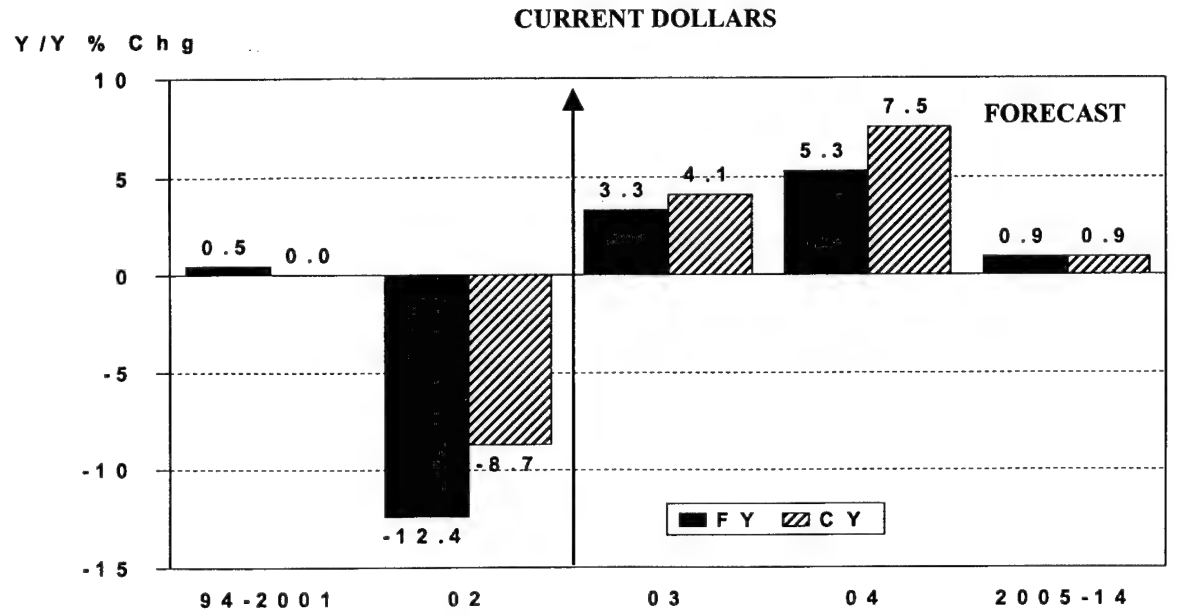
During the period 1970 through 1977, domestic real yield declined at a rate of 1.3 percent a year. Since deregulation, the decline in real yield has accelerated, so that by 2001 real yield fell to 13.76 cents, an average yearly decline of 2.2 percent--1.7 times higher than the rate achieved during the 1970s. In the 1970s the dominant reason for the decrease was the introduction of large numbers of more efficient jet aircraft into the air carrier fleets. In the 1980s the decline resulted from the airlines adjusting to deregulation by rationalizing their route structures and increasing labor productivity.

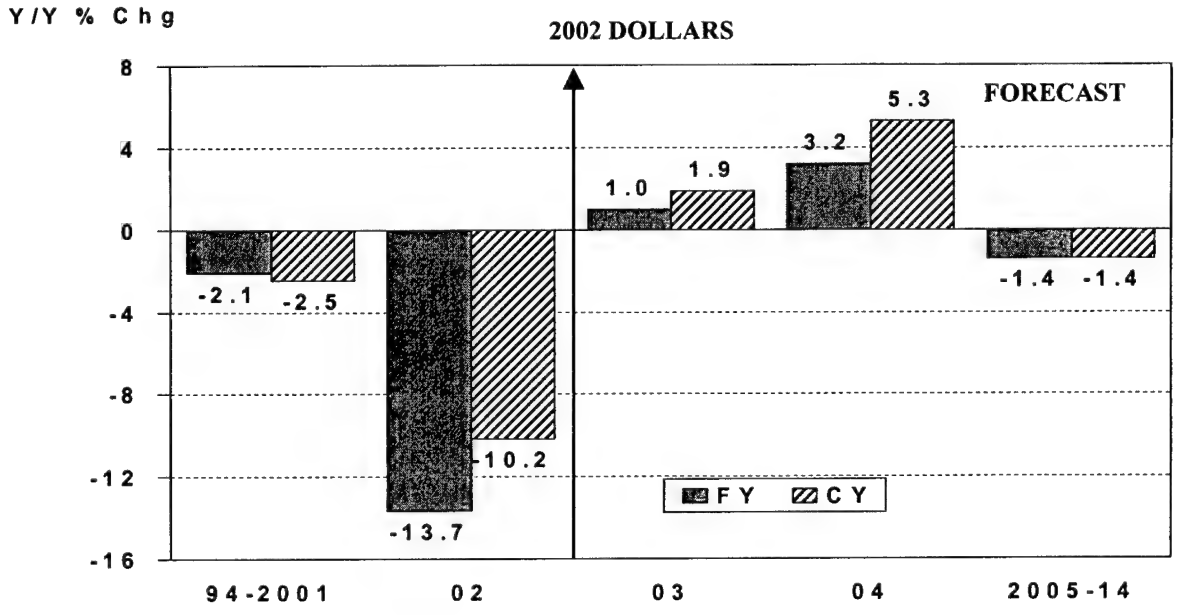
Financial weakness of the industry in the early 1990s along with excess capacity, the growth of new-entrant, low-cost carriers, and the expansion of Southwest into new markets has brought about intense fare competition. Increased competition has pushed high-cost carriers into restructuring, increasing productivity, and lowering unit costs.

In 2001 nominal yield increased in the first two quarters, then declined sharply as the weak economy reduced business traffic. Nominal yield was down in all quarters of 2002, as the fall in demand following the September 11th attacks and a weak economy forced carriers to heavily discount fares in order to attract traffic. Real yield fell 13.7 percent for the year, the largest decline in the modern era.

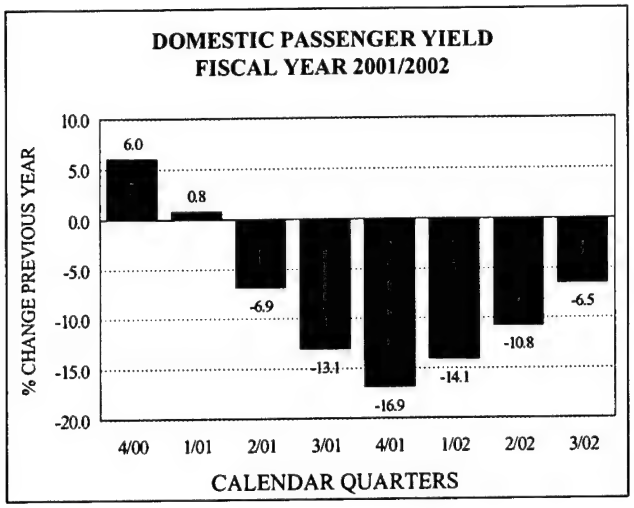
Nominal yield is forecast to increase 3.3 percent in 2003 as the heavy discounting used to stimulate demand from depressed levels following the September 11th attacks wanes and business and leisure demand improve. Yield will be down versus 2002 in the first quarter but turns positive for the balance of the fiscal year. Yield continues its upward trend in 2004 with nominal yield up 5.3 percent as discounting is less prevalent, demand returns to more normal

U.S. COMMERCIAL LARGE AIR CARRIERS: DOMESTIC PASSENGER YIELD





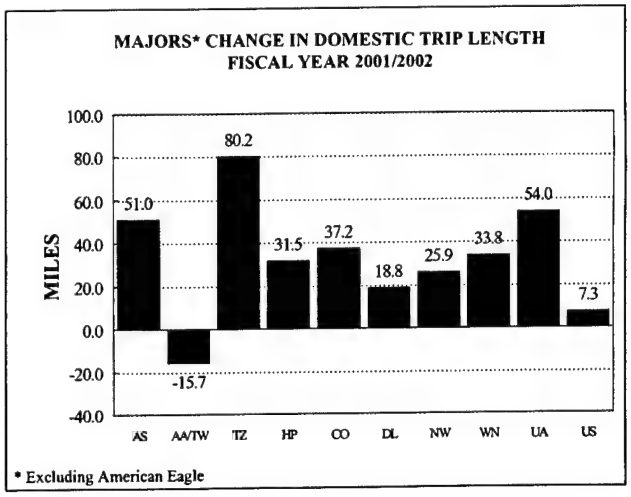
levels, and capacity remains tight as carriers will be hesitant to increase too rapidly.



In the long run, the effects of continued competition (especially from low fare carriers), productivity increases, and expanding capacity more than offset rises in jet fuel and security costs. It is also assumed that the air carriers will optimally adjust their capacity to meet future demand. During the period 2005 through 2014, nominal yield increases 0.9 percent a year, while real yield declines 1.4 percent. Over the 12-year forecast period, nominal yield increases from 11.87 cents in 2002 to 14.30 cents in 2014, with real yield decreasing 0.6 percent a year.

Passenger Trip Length

In 2002 the average domestic passenger trip length for large U.S. carriers increased 22 miles. This was due largely to the continued turning over of short-haul routes to code-sharing regional partners and the expansion of Southwest and other low fare carriers into longer-haul markets.



The rapid integration of new state-of-the-art aircraft into the regional/commuter fleet--especially regional jets with ranges of up to 1,500 miles—has begun to significantly alter the route system of the industry. These new aircraft are enabling regional/commuters to greatly expand the number and types of markets they serve.

In the near-term, the turnover of short-haul markets by the majors to their code-sharing regional partners will continue as the majors try to reduce costs. In addition it is assumed that short-haul demand will recover more slowly than in other markets as there are greater substitution opportunities for travelers in these markets relative to long-haul markets. As a result, domestic trip length is forecast to increase 6.0 miles in 2003. By 2004, the pace of short-haul market transfers slows and continued rapid growth in the short-haul low fare markets results in domestic trip length declining by 7.5 miles. During the period from 2005 to 2014, expansion of low-cost carriers into longer-haul markets, restructuring of the regional/commuter fleets, and expansion of point-to-point service, are expected to increase the domestic trip length modestly. For the entire forecast period, the average trip length increases 0.5 miles per year, increasing from 907.5 miles in 2002 to 913.8 miles in 2014.

Average Aircraft Size

Between 1986 and 1993, the average number of seats for the large domestic Form 41 carriers remained relatively stable at 154.5, with a standard deviation of only 0.4 seats. From 1993 through 2001, the average number of seats fell from 154.7 to 147.1 seats. The large increase in domestic short-haul traffic by the low-cost, low-fare carriers (Southwest, Airtran, etc.) is the most likely explanation for this decline.

In 2002, the trend of declining average seat size was reversed as the average number of seats for the large domestic Form 41 carriers increased 0.8 seats. The reason for this increase was that the large network carriers accelerated the shift of smaller, less dense markets to affiliated regional carriers and at the same time, retired a number of their smaller B-737's and DC-9's.

Current fleet plans by the large air carriers show that the average aircraft seat size is increasing. However, following the events of September 11th, the major carriers have deferred taking delivery of new aircraft. Thus increases in aircraft size will be very small in the near term. Those aircraft that will enter the fleet are larger than those in the existing fleet. The result will be an increase in the average seat size throughout the forecast period.

The seating capacity for domestic large air carriers is forecast to increase, on average, 0.9 seats per year, with modest increases in 2003 and 2004 of 0.5 and 0.8 seats, respectively, then rise 1.0 seats per year for the balance of the forecast. In 2014, the average aircraft seat size will be 159.2 seats, up from 147.9 seats in 2002.

Passenger Load Factor

Domestic load factor was relatively stable over the period 1978 through 1993, ranging from a low of 57.7 percent to 63.0 percent. From 1993 through 2000, the load factor increased 9.8 percentage points, expanding from 61.4 percent to 71.2 percent. During this period carriers developed the capability to rapidly adjust capacity to changing conditions in both the domestic and international markets to meet demand while pushing up load factors.

In 2002, domestic load factor remained unchanged from 2001 at 70.0 percent. Year-over-year domestic load factor was down 2.7 points in the 1st quarter, as demand fell precipitously following the attacks, then was positive for the balance of the year as capacity reductions generally matched the reduced level of demand. With the slight capacity decrease in 2003, domestic load factor is forecast to increase 2.5 points to 72.5 percent in 2003. Year-over-year quarterly increases of 0.5 to 4.2 points are forecast, with gradual improvement throughout the year as the full extent of the anticipated capacity reductions don't occur until the 2nd half of the year.

Load factor is projected to increase 0.4 points in 2004 to 72.9 percent with year-over-year increases in the early part of the year. Following a slight decrease in 2005, load factor increases are projected for the remainder of the forecast period as the industry returns to a more stable operating environment, resulting in a load factor of 75.5 percent by the end of the forecast period.

FORECASTS

Revenue Passenger Miles

During the economic expansion of the 1990's, domestic RPMs grew an average of 4.0 percent per year over the 10-year period. Scheduled domestic RPMs for U.S. large carriers totaled 443.6 billion in 2002, down 8.3 percent compared to the 1.3 percent decrease in 2001. Traffic declined 13.3 percent during the 1st half of the year but improved gradually throughout the period. Traffic declined in the 3rd quarter by 7.6 percent and then rose 1.1 percent in the 4th quarter, solely because of September's 19.8 percent increase.

Traffic is not expected to rebound sharply. Domestic RPMs for the large carriers in 2003 are forecast to be up 2.7 percent with faster growth occurring in the 1st half of the year. The modest recovery of traffic continues in 2004, with growth of 3.8 percent. As the economy returns to its long-term growth rate in 2005, traffic increases, on average, 3.6 percent a year for the remainder of the forecast period. The average annual increase in domestic RPMs over the 12-year planning horizon is forecast to be 3.6 percent, with domestic RPMs for the large carriers reaching 674.8 billion in 2014.

Passenger Enplanements

U.S. scheduled domestic large air carriers enplaned a total of 488.8 million passengers in 2002, down 10.5 percent from 2001, and the first back to back decline in annual enplanements since 1980-81. Similar to RPMs, domestic enplanements were down throughout the year with improvement occurring throughout the period. The 18.7 percent decline in the 1st quarter was the greatest decline in year-over-year enplanements in the post deregulation era.

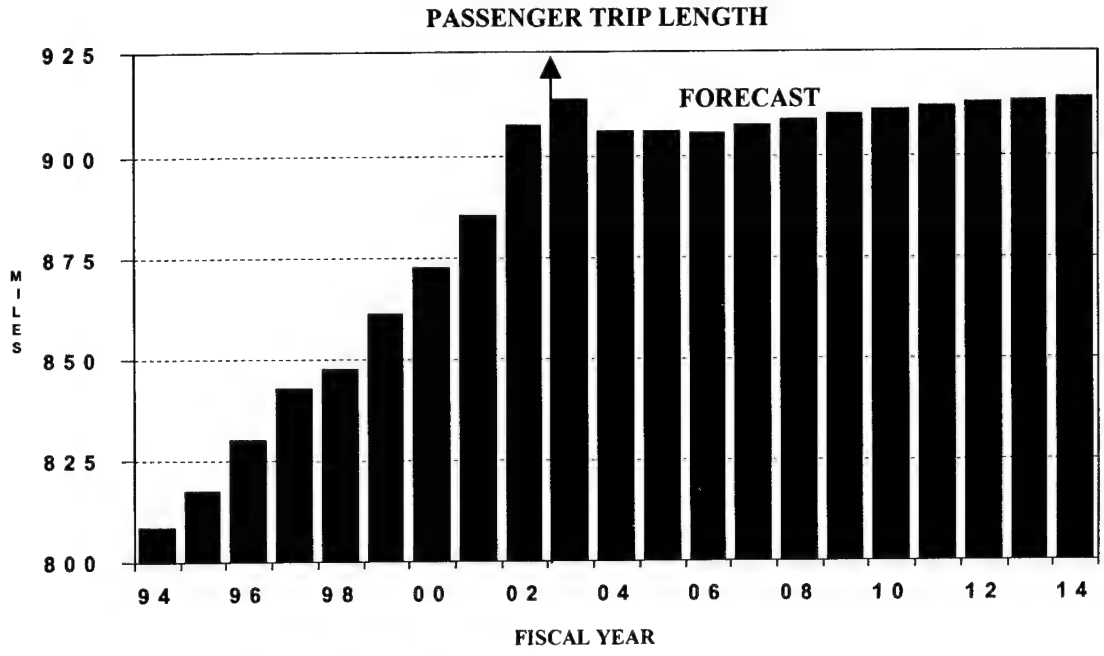
Enplanements are forecast to increase 2.0 percent in 2003 with faster growth in the 1st half of the year. In 2004, modest growth of 4.7 percent is forecast, with growth fairly steady throughout the year. For the remainder of the forecast period, enplanements increase 3.5 percent a year. The growth in enplanements is projected to average 3.5 percent annually during the 12-year forecast period, with the number of large carrier domestic enplanements reaching 738.4 million in 2014.

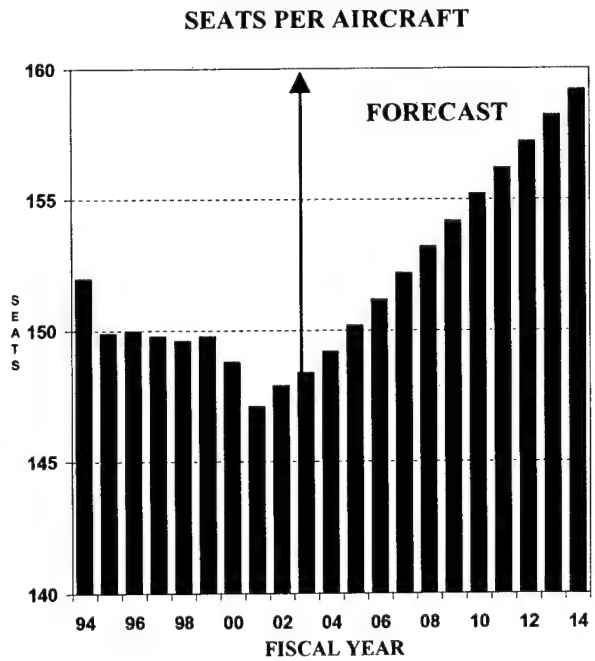
INTERNATIONAL PASSENGERS: METHODOLOGY AND FORECASTS

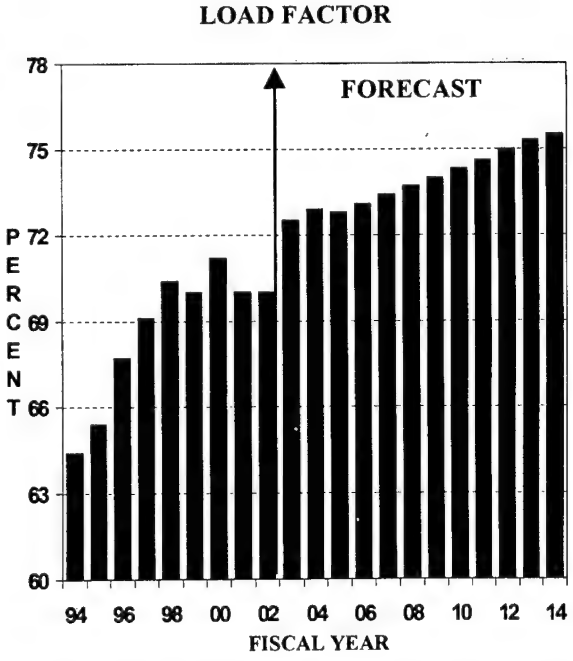
MODELING INTERNATIONAL RPMS AND ENPLANEMENTS

Similar to the forecasts of domestic traffic, forecasts for U.S. flag carriers' international RPMs and enplanements for the three world regions--Atlantic, Pacific, and Latin America, are a combination of near-term expert judgment forecasts coupled with longer term forecasts based on the forecast methodology described below. Forecasts for 2003 and 2004 were developed utilizing assumptions about capacity and the recovery in demand. Forecasts for 2005 and beyond were developed by initially estimating total passengers (U.S. and foreign flag carriers) for each world region based on the economic activity in both the region and in the U.S. Second, projections of U.S. and regional GDP, coupled with models relating U.S. flag carriers' enplanement growth to total passenger growth, plus assumptions concerning U.S. market share in each region, are used to forecast U.S. flag carriers' international enplanements. The forecasts of enplanements and assumptions

U.S. COMMERCIAL LARGE AIR CARRIERS: DOMESTIC OPERATIONAL VARIABLES

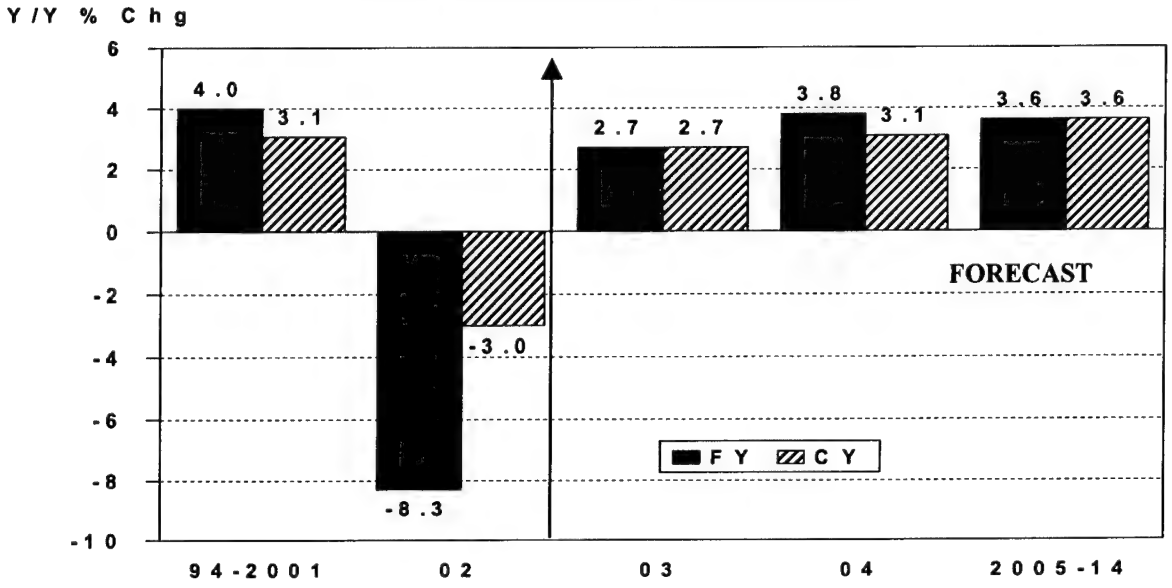




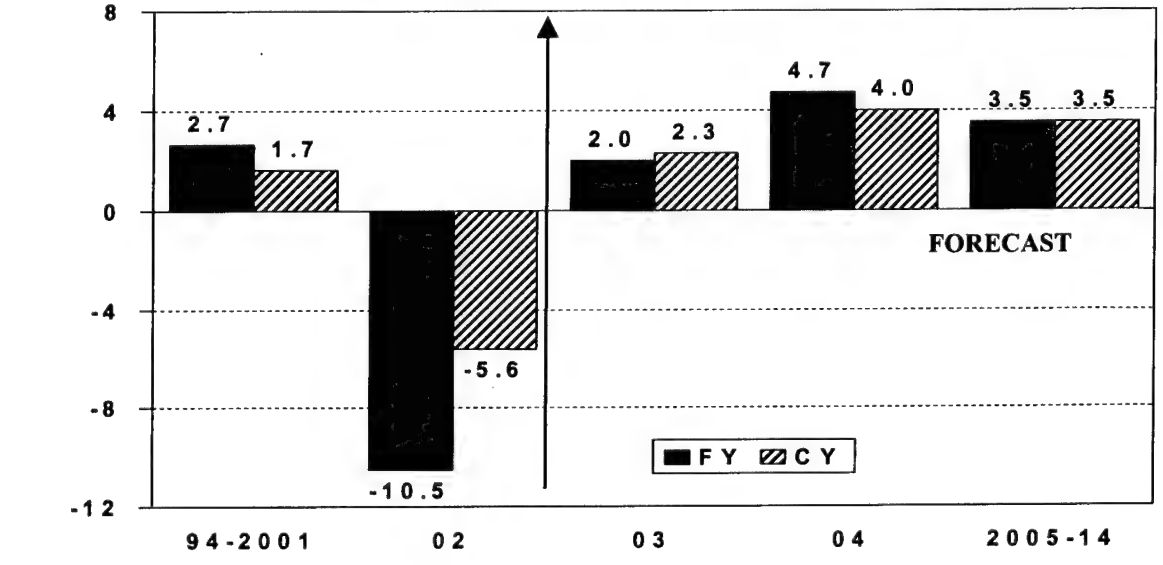


U.S. COMMERCIAL LARGE AIR CARRIERS: DOMESTIC FORECASTS

SCHEDULED REVENUE PASSENGER MILES



SCHEDULED PASSENGER ENPLANEMENTS



concerning average trip length are then used to derive U.S. flag carriers' international RPM projections. This approach ties U.S. flag carrier activity in the international regions to total demand and should, over the long-term, increase the accuracy of the FAA facility workload and trust fund revenue projections.

Although economic theory suggests that fares, exchange rates, and relative country consumer prices should be important arguments in an international demand equation, the analyses clearly demonstrate that aggregate economic activity explains a large percentage of the variability in demand and is sufficient to develop accurate macro international forecasts.

However, these aggregate results may differ significantly from micro analyses of individual markets categorized by distance, type of flying, and level of competition.

ATLANTIC MARKET

U.S. Large Air Carrier Yield and Operational Variables

Capacity

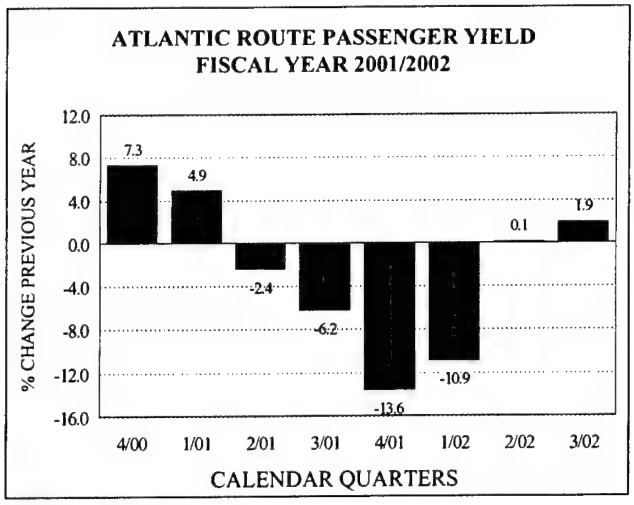
After increasing 32.6 percent between 1996 and 2001, U.S. carrier capacity in Atlantic markets decreased 13.9 percent in 2002. Year-over-year capacity was down in every month except September with the largest decreases occurring between October and February. Based on published OAG schedules and discussions with carriers, capacity increases during the next few years are expected to be modest. In 2003, capacity is projected to increase 3.4 percent with capacity growing faster in the 1st half of the year and then slowing as anticipated cuts by United are implemented.

Atlantic market capacity in 2004 is projected to increase just 1.4 percent with year-over-year increases not occurring until the later half of the year. For the period 2005 through 2014, forecast capacity growth averages 4.6 percent per year with the rates of growth diminishing over the course of the forecast. The average annual growth over the 12-year forecast period is 4.3 percent with Atlantic ASMs totaling 161.1 billion in 2014.

Passenger Yield

In 2002 current dollar yield (9.27 cents) declined 4.6 percent, while real yield in the market dropped 6.0 percent. This followed a drop in real yield in 2001 of 3.2 percent. Yield was down more than 10 percent on a year-over-year basis in the 1st half of 2002 as the events of September 11th led to a precipitous drop in demand that forced carriers to offer significant discounts in order to attract traffic. In the 2nd half of the year, yield was up versus 2001 as business demand picked up. In 2003, yield is forecast to be up modestly on a year-over-year basis. For all of 2003, yield in Atlantic markets is forecast to rise 2.9 percent in nominal terms, and 0.6 percent in real terms.

Yield resumes its historic decline in real terms in 2004 despite a small increase in capacity in the market. This reflects concerns about possible discounting by United and other financially distressed carriers during the slower winter months. Nominal yield is forecast to be up just 0.7 percent while real yield declines 1.3 percent. For the balance of the forecast period, real yield is projected to decline 0.6 percent a year, while nominal yield is expected to increase at an annual rate of 1.7 percent. For the period 2002 through 2014, nominal yield increases from 9.27 to 11.29 cents.



Passenger Trip Length

In 2002 the average passenger trip length in the Atlantic market decreased 43.1 miles, the largest decrease since 1986. Most carriers recorded decreases in trip length with American (including TWA) recording the largest decrease. Since 1990, average trip length has increased from 3,341.4 miles to 4,168.7 miles--up 827.3 miles. The increase in average passenger trip length over the period was primarily due to more direct flights and expanded service into Central and Eastern Europe. In the future we expect that trip length will increase with expanded service from non-East Coast U.S. gateways, especially in light of anticipated service reductions by United at Dulles.

The average trip length is forecast to increase only 8 miles in 2003 as capacity additions by the industry (mostly returning to markets abandoned or frequency reductions in the wake of the September 11th terrorist attacks) will lead to a greater share of the traffic flying on longer haul routes. Passenger trip length is anticipated to increase 33.0 miles in 2004 and then moderate throughout the forecast and increase an average 13.2 miles annually during the forecast period. For the period 2002 through 2014, trip length in Atlantic markets increases from 4,168.7 miles to 4,332.3 miles--up 163.6 miles.

Average Aircraft Size

The average aircraft size in the Atlantic market continuously increased during the 1970s and early 1980s as the widebody DC-10s/L-1011s and B-747s dominated the market, peaking at 332.0 seats in 1985. Since the mid 1980s, the advent of the B-767 and other aircraft flying Extended-Range Twin-Engine Operations (ETOPS), has resulted in the average seat size steadily declining. In 2002 the average aircraft size increased slightly (1.3 seats) to 233.9 seats—98.1 seats below the 1985 peak. Over the 12-year forecast period, the average aircraft size in the Atlantic market gradually increases as the major carriers expand the number of non-stop city-pair services and use of larger two-engine widebody aircraft. Average aircraft size increases 0.9 seats per year to 244.9 seats by 2014.

Passenger Load Factor

Despite the 13.9 percent decrease in capacity in 2002, the Atlantic market load factor rose just 0.6 points from 76.4 percent to 77.0 percent as RPMs declined by 13.2 percent. Traffic fell 28.5 percent during the 1st quarter of the year but then improved, falling 12.8 percent during the 2nd and 3rd quarters. Traffic declined only 0.9 percent on a year-over-year basis in the 4th quarter, mainly because of the impact of the events of September 11th and their aftermath on the prior year figures.

Despite the capacity increase forecast for the Atlantic market, load factor in Atlantic market is forecast to rise 0.8 points in 2003 as traffic increases faster than capacity. Year-over-year increases in load factor are forecast throughout the year. Load factor is forecast to rise slightly in 2004 as traffic growth slightly outpaces capacity increases. For the year, load factor in

the Atlantic market is projected to increase 0.6 points from 77.8 to 78.4 percent. Load factor increases steadily to 80 percent by 2008 as traffic increases, driven by economic growth and falling real yields, outpace capacity increases. For the balance of the forecast, load factor remains at 80 percent as the market achieves equilibrium.

Forecasts

Total Passengers: U.S. and Foreign Flag Carriers

Based on Immigration and Naturalization Service (INS) data, which is compiled by the Department of Commerce, passengers in the Atlantic market decreased 10.3 percent in CY 2001 (the latest full year for which data is available). Data for the first half of 2002 indicate that significant declines in traffic continue.[5]

U.S. air carrier market share for the Atlantic region had been steadily declining since 1988, when it peaked at 48.5 percent. However in 2000 and in 2001, U.S. market share increased from 38.6 percent to 40.0 percent. In 2002, preliminary data for the 1st half of the year indicate that the increase in U.S. flag carrier share continued. Based on 1st half data, we project that U.S. carrier market share will increase significantly to 42.7 percent, the highest level since 1994.

Total passengers traveling in the Atlantic market are forecast to grow faster than the rate of U.S. flag carriers for CY 2003 and 2004. In CY 2003, passengers are forecast to increase 4.9 percent with the highest rates of growth occurring in the 2nd half of the year. In CY 2004, growth is higher in the 1st half of the year. For the year, total passengers traveling in the Atlantic market are forecast to increase 5.9 percent. For the remainder of the forecast period, total passengers increase an average of 4.5 percent per year. Over the entire forecast period, total passengers increase an average of 4.7 percent per year, from 43.3 million in 2002 to 75.4 million in 2014.

The International Civil Aviation Organization (ICAO) North Atlantic Traffic Forecasting Group (Canada, U.S., U.K., and Portugal) was formed with the primary objective of developing forecasts of air traffic over the North Atlantic and between North American and the Caribbean. Annual forecasts are provided for both total passengers and aircraft movements to support air navigation systems planning activity for ICAO and its member states.

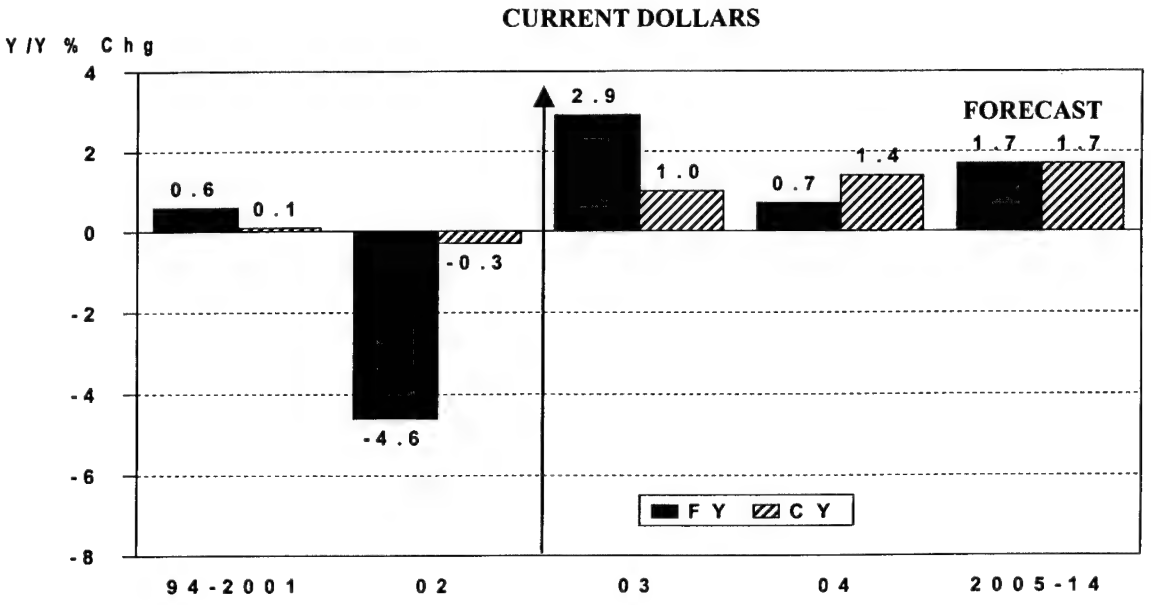
The Group met in May 2002 and updated its forecasts to incorporate the effects of the September 11th attacks. Copies of the 2002 report entitled, "*North Atlantic Air Traffic Forecasts for the Years 2000-2005, 2010 and 2015,*" can be obtained from the FAA's Statistics and Forecast Branch, Office of Aviation Policy and Plans, phone (202) 267-3355.

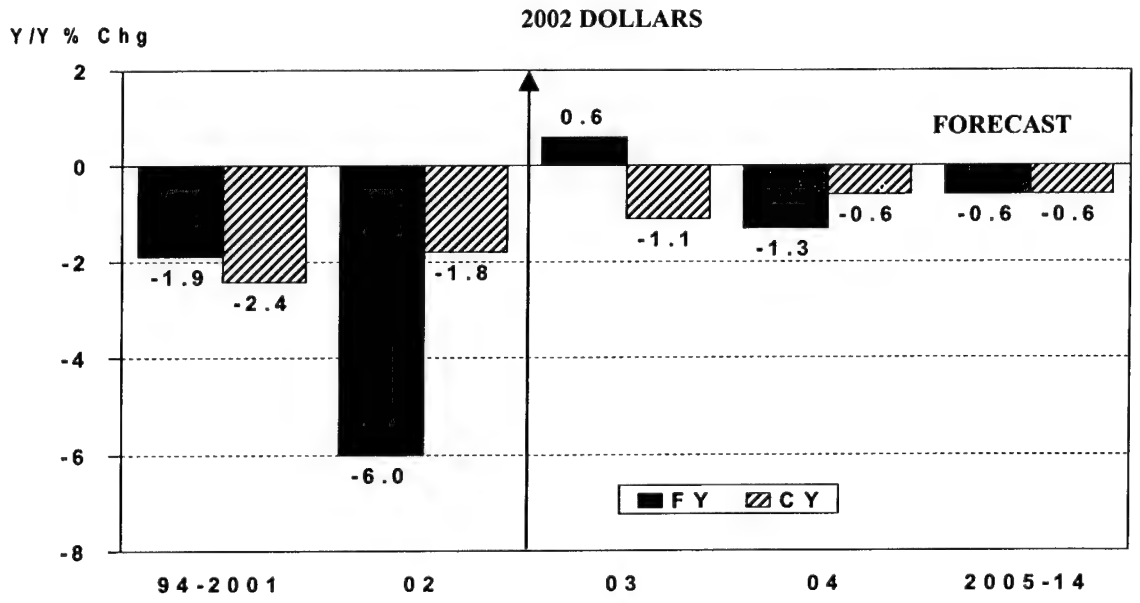
U.S. Large Carrier Passenger Enplanements

U.S. scheduled air carriers in the Atlantic market enplaned a total of 18.0 million passengers in 2002, down 12.3 percent. Enplanement growth was negative for every month of the year through August, then turned positive in September. Atlantic passenger enplanements are forecast to rebound in 2003, with the largest year-over-year increases occurring early in the year. For the year, enplanements are forecast to increase 4.3 percent. Growth in passengers is forecast to

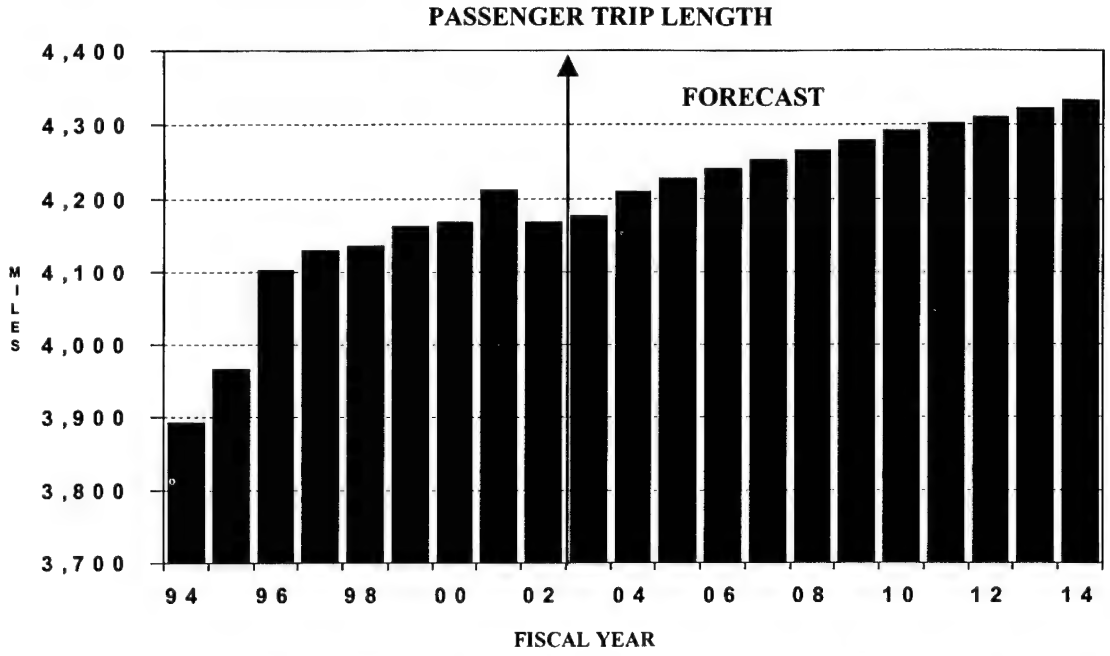
[5] CY 2002 data is available through June. Estimates for the remainder of the year are based on ATA (thru Nov) and AEA (thru Oct) data.

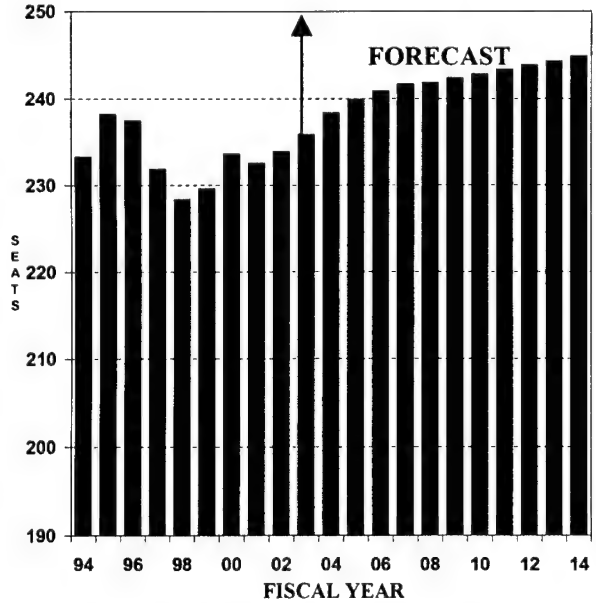
U.S. COMMERCIAL LARGE AIR CARRIERS: ATLANTIC PASSENGER YIELD

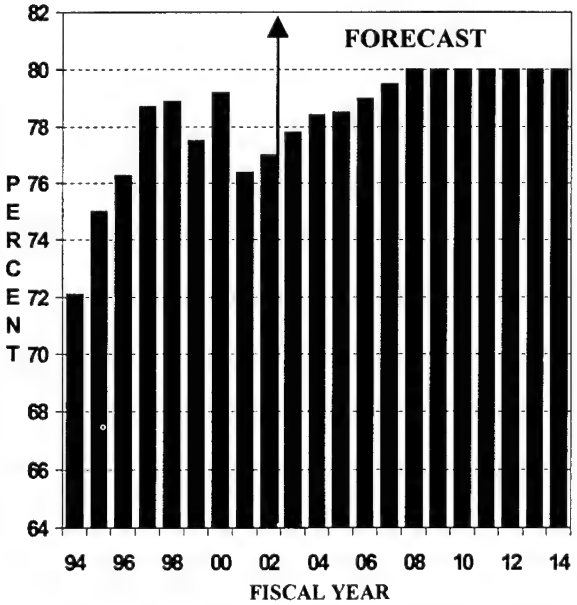




U.S. COMMERCIAL LARGE AIR CARRIERS: ATLANTIC OPERATIONAL VARIABLES







slow to 1.4 percent in 2004, with the fastest growth occurring during the second half of the year. During the period 2005 through 2014, enplanements are forecast to increase 4.5 percent per year on average, stimulated by economic growth and falling real yields. For the entire 12-year forecast period, enplanements increase on average 4.3 percent annually. The number of Atlantic market enplanements reaches 29.7 million in 2014—65.6 percent higher than in 2002.

U.S. Large Carrier Revenue Passenger Miles

From 1991 through 2000, Atlantic market RPMs continuously increased at a rate of 7.1 percent per year, due to strong, steady economic growth in the U.S. and Europe and declining real yields. After falling 1.0 percent in 2001, Atlantic market RPMs fell 13.2 percent to 74.8 billion in 2002. Declines in traffic were greatest in the 1st half of the year and then gradually improved throughout the balance of the year.

RPMs are up sharply early in 2003 but continued public concerns about flying as well as a modest economic recovery in both the U.S. and Europe limit the strength of the traffic recovery. Traffic is projected to increase 4.5 percent for all of 2003. The recovery in traffic slows in 2004 as anticipated capacity reductions by United limit traffic growth to 2.2 percent. The highest rates of growth are projected to occur in the later half of the year. Beyond 2004 for the balance of the forecast period, RPMs are projected to grow 4.8 percent per year on average. The average annual increase in RPMs over the 12-year forecast horizon is 4.6 percent, reaching 128.8 billion in 2014.

LATIN AMERICAN MARKET

U.S. Large Air Carrier Yield and Operational Variables

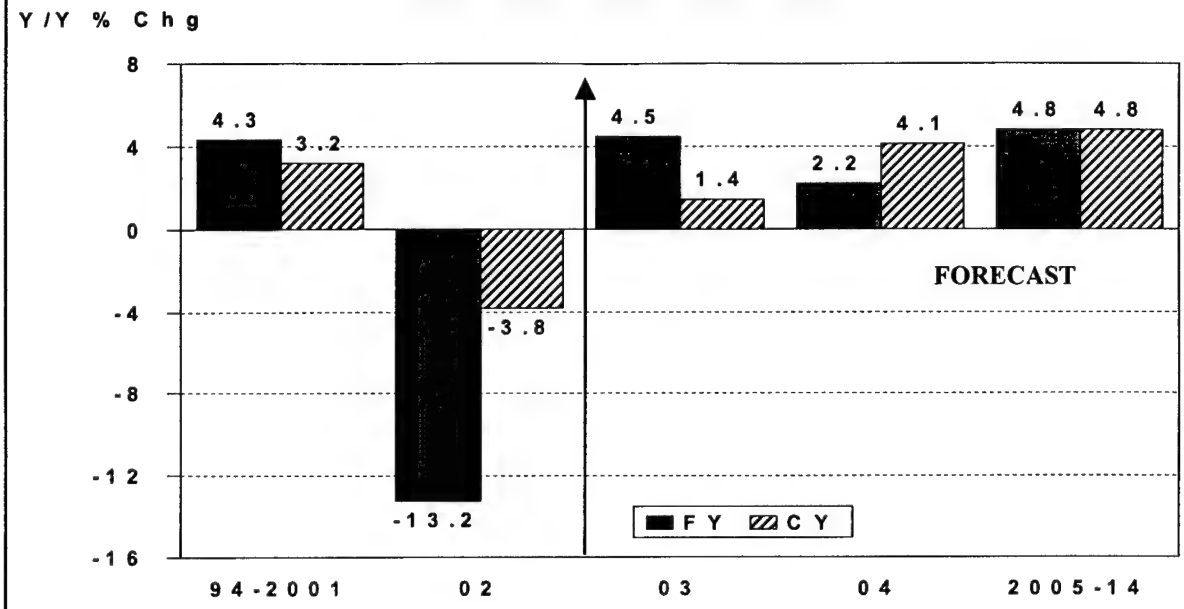
Capacity

In 2002, regional capacity decreased 3.8 percent, following increases of 2.9 percent in 2001 and 0.5 percent in 2000. Despite the decrease in 2002, capacity in the market is up 32.4 percent since 1995. Capacity declines averaged 6.7 percent during the first 9 months of FY 2002. In the 4th quarter, capacity began to grow again, running flat during July and August and then up 17.7 percent in September.

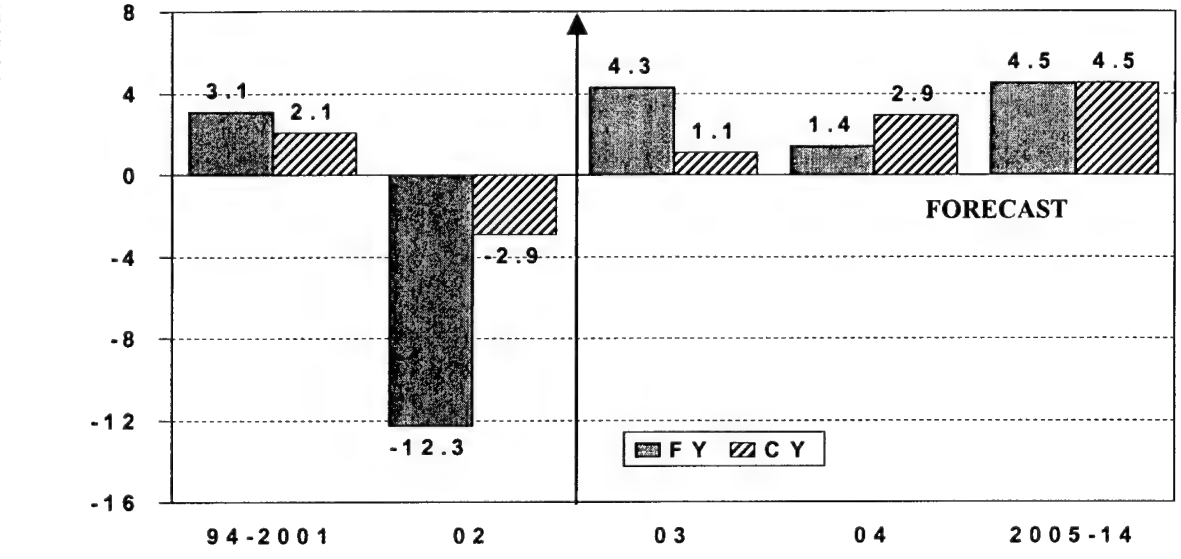
Based on OAG schedules and discussions with carriers, capacity growth in the Latin American market will be similar to other international markets. Capacity is projected to increase about 5 percent on a year-over-year basis in the 1st half of FY 2003, then decline in the 2nd half of the year. For the year as a whole, capacity is projected to increase 2.1 percent. Capacity growth is projected to be just 1.8 percent in 2004, then accelerate to 4.7 percent in 2005 as carriers continue to expand service into both the Caribbean and South America. For the period 2005 through 2014, forecast capacity growth averages 5.7 percent per year. The average annual growth over the 12-year forecast period is 5.0 percent with Latin American ASMs totaling 91.2 billion in 2014.

U.S. COMMERCIAL LARGE AIR CARRIERS: ATLANTIC FORECASTS

SCHEDULED REVENUE PASSENGER MILES

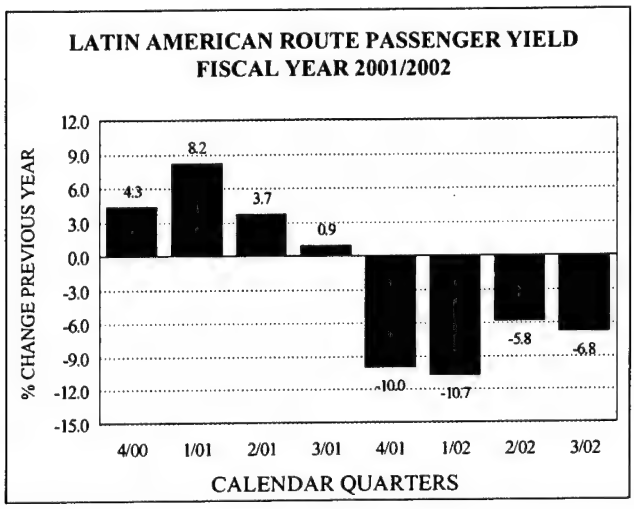


SCHEDULED PASSENGER ENPLANEMENTS



Passenger Yield

In 2002 Latin American yield (12.42 cents) decreased 8.5 percent while real yield declined 9.8 percent. In 2001 nominal and real yield increased 4.4 and 1.2 percent, respectively. Since 1995, real yield in the market has declined 22.4 percent.



In 2003 and 2004 real yield is forecast to remain flat as weak demand to deep South American markets (Argentina, Brazil) is offset by increased flying to relatively shorter haul Caribbean destinations. From 2005 through the remainder of the forecast period, real yield resumes its historic decline, falling at a rate of 0.5 percent a year. During the 12-year forecast period, real yield declines at a rate of 0.4 percent a year, while nominal yield increases at an annual rate of 1.8 percent, reaching 15.37 cents in 2014.

Passenger Trip Length

For the first time since 1990, passenger trip length in Latin America declined, falling 68.7 miles to 1,619.2 miles. Carriers redeployed capacity from longer haul destinations in South America to relatively shorter haul destinations in the Caribbean and Mexico. Despite the decline in 2002, the average trip length has increased 384.4 miles, from 1,234.8 miles in 1990 to its current level.

The primary reason for the increase in trip length during the 1990's was the continued expansion of U.S. carriers into South America--Argentina, Brazil and Chile--and the expansion of routes from the Northeast to the Caribbean. Except for a one year decline in 2003, this trend is expected to continue over the forecast period. The average trip length is forecast to decrease 37.9 miles in 2003 as carriers continue to reduce capacity from longer haul destinations in South America. Beginning in 2004, capacity in the longer haul destinations of the region will be restored gradually leading to an increase in trip length of 12.4 miles. For the balance of the forecast period--2005 through 2014--trip length increases average 10.9 miles a year. During this time, Latin American market trip length expands from 1,593.6 to 1,684.7 miles.

Average Aircraft Size

The average aircraft size in the Latin American market increased during the 1970s and early 1980s as widebody aircraft dominated the market, peaking at 220.2 seats in 1986. With the advent of the B-757 and other flying ETOPS since the mid 1980s, the average seat size has steadily declined. In 2002 the decline continued as average seat size was just 172.8 seats--a decline of 47.3 seats from 1986, and the lowest figure since 1974.

Average seat size is projected to increase to 173.5 seats in 2003, as reductions in service will be mostly in routes that utilize older less efficient two-engine aircraft. For the balance of the forecast, the average aircraft size in the Latin American market is expected to gradually increase as the major carriers expand the number of non-stop city-pair services into deep South America, and their use of larger two-engine widebody aircraft. The average aircraft

size is forecast to increase approximately 0.5 seats per year to 179.0 seats by 2014.

Passenger Load Factor

Load factor in the Latin American market showed little variability from 1987 through 1994, ranging from a low of 57.9 to 62.5 percent. From 1994 through 2001, the load factor increased 8.3 percentage points, expanding from 60.9 to 69.2 percent.

In 2002, declines in RPMs were greater then declines in capacity, resulting in load factor declining to 66.5 percent—down 2.7 points from the 2001 figure. Year-over-year load factor decreases were recorded throughout the year with the greatest decrease occurring in the 1st quarter, reflecting the immediate impact of the events of September 11th on demand.

Load factor is forecast to increase 1.4 points to 67.9 percent in 2003 with the largest increases in the later part of the year. In 2004 the load factor is forecast to increase to 68.8 percent, a 0.8 point increase from 2003, with the largest gains in the 1st half of the year. During the period 2005 to 2009, load factor is forecast to climb gradually reaching 70 percent by 2009. For the duration of the forecast the load factor remains at 70 percent as the market reaches equilibrium.

Forecasts

Total Passengers: U.S. and Foreign Flag Carriers

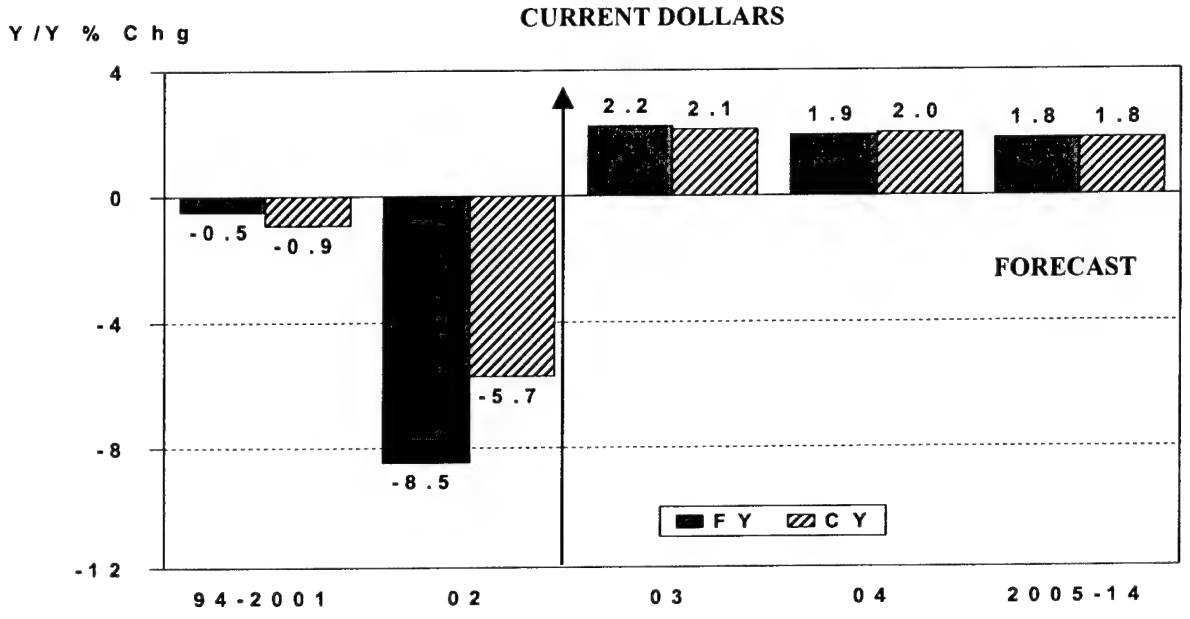
Based on INS data, total passengers in the Latin American market (South America, Central America/Mexico, and the Caribbean) fell 4.8 percent in CY 2001. The largest decrease in 2001 occurred in the South America region, which was down 5.4 percent. The Caribbean region decreased 4.5 percent, while the Central America/Mexico region decreased 4.8 percent. During the period 1991-2001 the South American region has been the fastest growing with passengers increasing 6.2 percent annually. At the same time, the Central America/Mexico market increased 4.6 percent per annum, while the Caribbean market increased only 2.2 percent a year, reflecting the impact made by cruise traffic in the region.

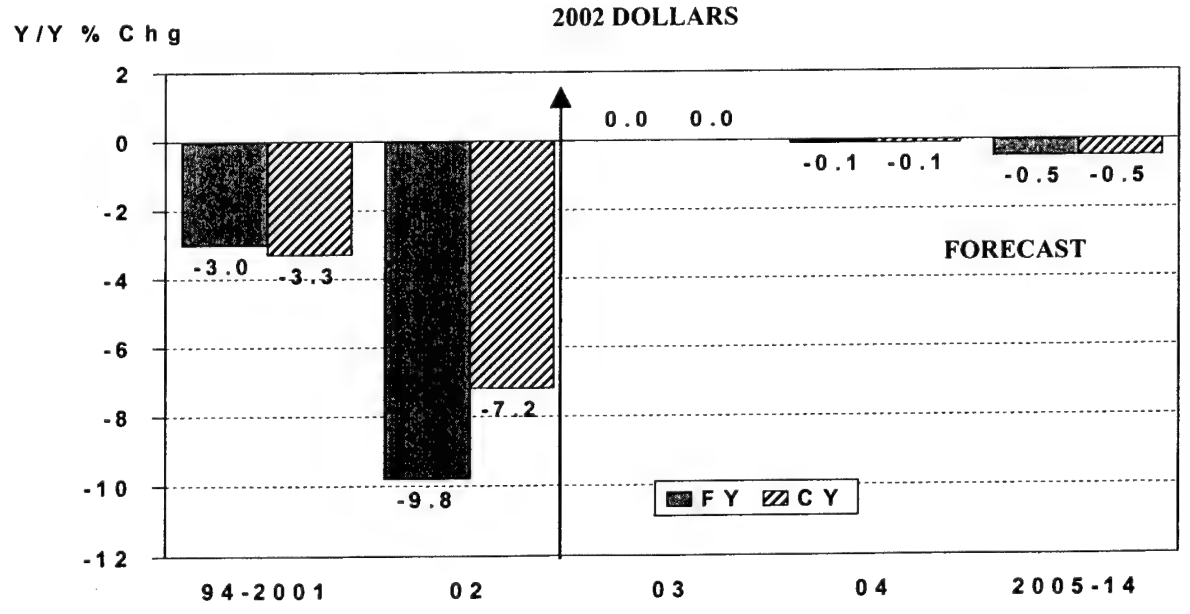
U.S. air carriers' market share in the Latin American region has been increasing steadily over the past decade. Between 1991 and 1996, U.S. air carriers' market share increased from 58.8 to 64.3 percent. Following a decline in share in 1997, U.S. carriers' market share has increased from 61.7 percent to 65.1 percent in 2001. Market share for U.S. carriers in the Caribbean, Central America/Mexico, and South America in 2001 was 73.3, 59.7, and 63.9 percent, respectively.

Between 1990 and 1998 the percentage of total passengers that were U.S. citizens traveling in the Latin American market decreased steadily from 67.3 percent to 63.4 percent. Continuing a trend of recent increases, the ratio increased from 64.8 percent in 2000 to 65.2 percent in 2001.

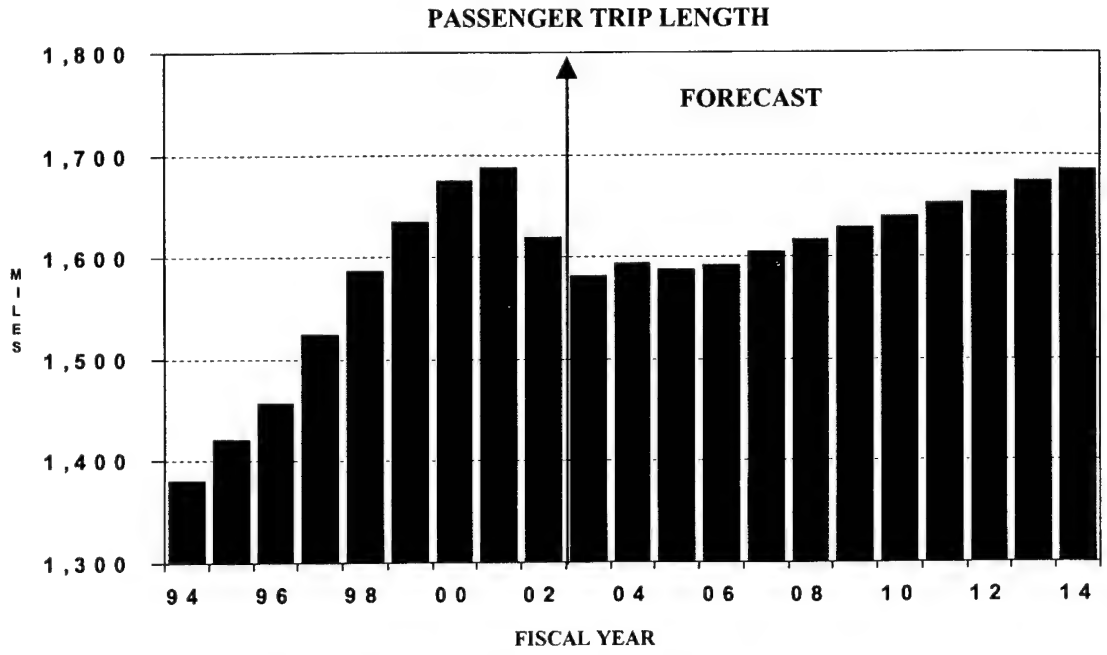
Preliminary data for 2002 on total passengers traveling in the Latin America market indicates that the decline in passengers following the September 11th attacks is slowing. Total passengers in the Latin America market are forecast to decline 1.2 percent in 2002. For 2003 and 2004, it is assumed that growth in the total market will be the same as the growth of U.S. flag carriers. In 2003, passengers are projected to grow 4.1 percent with the highest rates of growth in the 1st half of the year. Passengers grow at a similar rate in 2004 (4.3 percent) with growth increasing throughout the year. For the period 2005 – 2014, total passengers traveling in the Latin

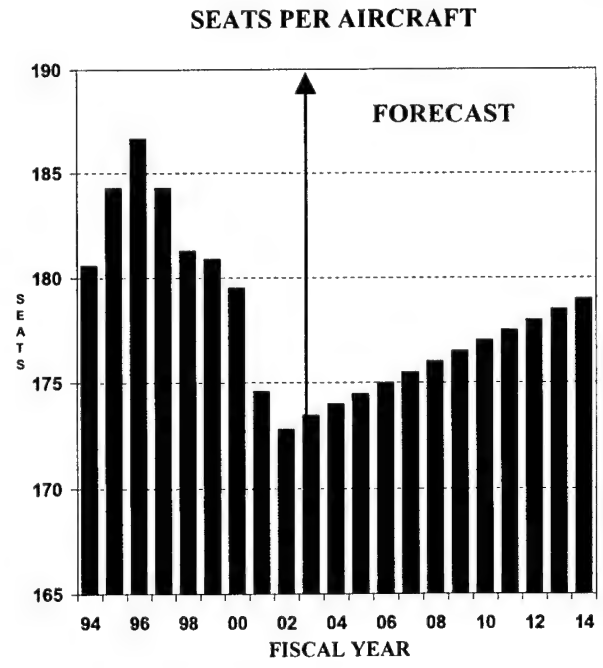
U.S. COMMERCIAL LARGE AIR CARRIERS: LATIN AMERICAN PASSENGER YIELD

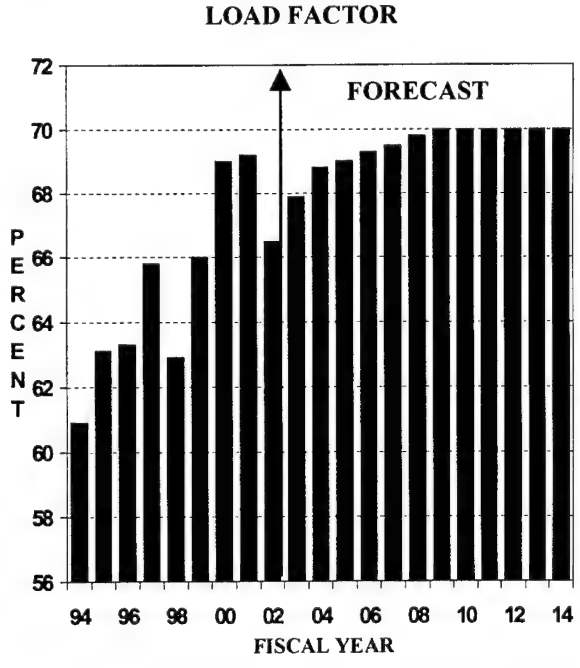




U.S. COMMERCIAL LARGE AIR CARRIERS: LATIN AMERICAN OPERATIONAL VARIABLES







American market are projected to increase 5.1 percent per year. Over the entire forecast period, total passengers in the Latin America market increase 5.0 percent per year, from 38.3 million in 2002 to 68.8 million in 2014.

U.S. Large Carrier Passenger Enplanements

U.S. scheduled large air carriers in the Latin American market enplaned a total of 20.9 million passengers in 2002, down 3.6 percent from 2001. Year-over-year decreases occurred in every month through June except March, with double-digit decreases recorded in October and November. Beginning in July, year-over-year passengers were up with September recording a 23.2 percent increase.

In 2003, passengers are forecast to increase 6.7 percent with the largest increases occurring in the 1st half of the year. Growth moderates in 2004 with passengers increasing 2.3 percent. Growth is slowest in the 1st half of the year and then picks up in the 2nd half. For the period 2005 – 2014, economic growth in both the U.S. and in Latin America propel enplanements upward at a rate of 5.2 percent per year. The growth in enplanements is projected to average 5.1 percent annually during the 12-year forecast period, with the number of Latin American market enplanements reaching 37.9 million in 2014.

U.S. Large Carrier Revenue Passenger Miles

Latin American market RPMs for U.S. large carriers steadily increased between 1993 and 2001, due primarily to strong economic growth in the U.S. and Latin America and declining real yield. During this period, RPMs in the market increased 7.5 percent a year. In 2002, Latin American market RPMs declined 7.5 percent, totaling 33.9 billion. Year-over-year decreases occurred throughout the year until September, which had an increase of 18.8 percent.

RPMs are forecast to increase 4.2 percent in 2003 with the strongest growth in the 1st half of the year. RPM growth slows in 2004, with a projected increase of 3.2 percent. Growth is slowest in the 1st half of the year and then increases in the 2nd half of the year. For the balance of the forecast period RPMs are forecast to grow 5.9 percent per year. The average annual increase in RPMs over the 12-year forecast horizon is 5.4 percent, reaching 63.8 billion in 2014.

PACIFIC MARKET

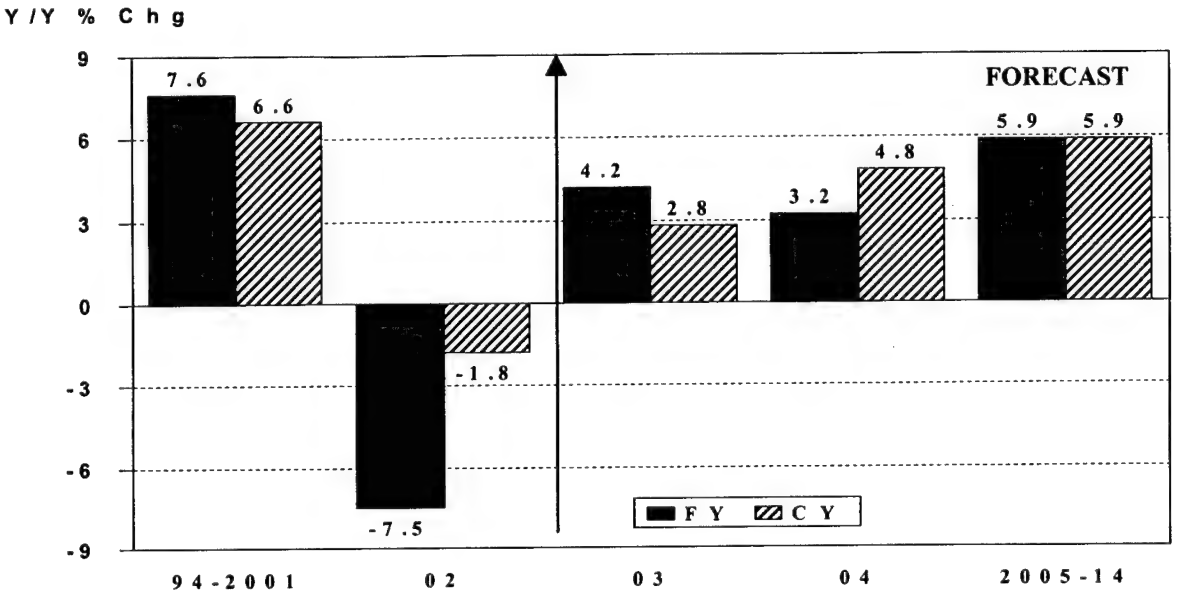
U.S. Large Air Carrier Yield and Operational Variables

Capacity

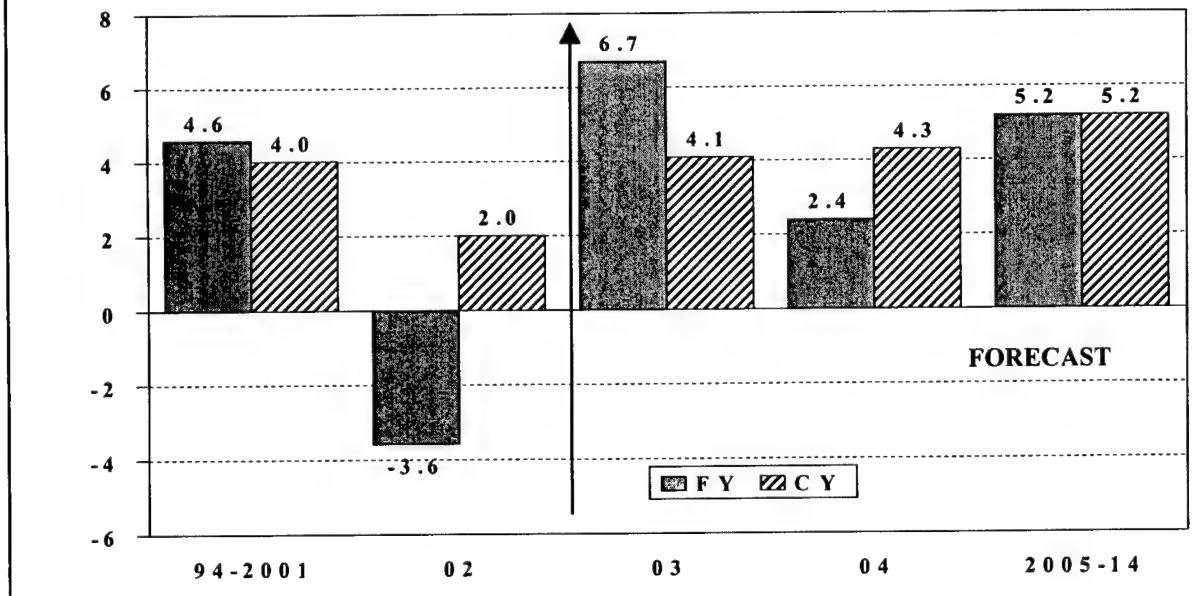
Following a modest increase in 2000 and 2001 after the Asian financial crisis of the late 1990's, capacity in Pacific markets declined by 20 percent in 2002. Capacity was down throughout the year with the greatest decreases occurring in the 1st part of the year. In 2003, capacity is up sharply in the early part of the year, then tightens as anticipated reductions by United offset capacity increases by other carriers. For the year as a whole, capacity increases 3.5 percent. In 2004, capacity growth is projected at 3.3 percent with growth most rapid in the later half of the year. For the balance of the forecast period, capacity is projected to increase an average of 4.9 percent per year. For the 12 year forecast period, average annual capacity growth is forecast to be 4.8 percent with ASMs in Pacific markets totaling 110.6 billion in 2014.

U.S. COMMERCIAL LARGE AIR CARRIERS: LATIN AMERICAN FORECASTS

SCHEDULED REVENUE PASSENGER MILES

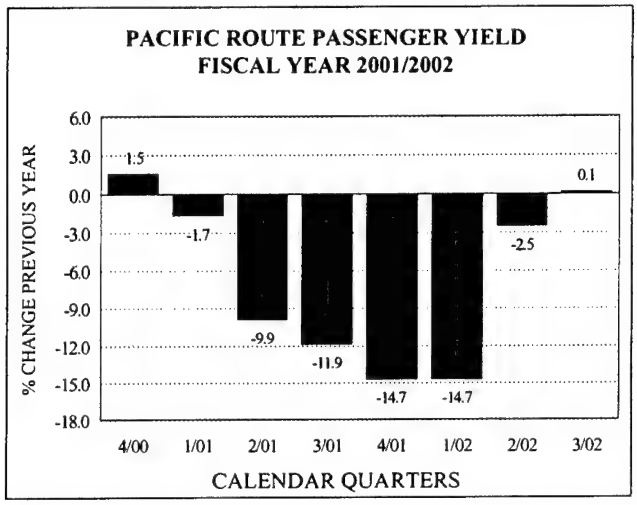


SCHEDULED PASSENGER ENPLANEMENTS



Passenger Yield

Continued weakness in demand and public concerns about flying following the September 11th attacks led to a nominal yield decline in the Pacific market of 7.6 percent in 2002. Real yield in 2002 decreased 9.0 percent for the 2nd consecutive year. Yield declines were steepest in the 1st half of the year and by the summer quarter the declines in yield had ceased.



A modest increase in yield is forecast in 2003. Year-over-year increases in excess of 3 percent are forecast for the 1st half of the year, then moderate for the balance of the year. For the year as a whole, nominal yield is forecast to increase 1.4 percent but decline 0.8 percent in real terms. Capacity increases faster than demand increases in 2004 and dampens any significant recovery in yield. Nominal yield is forecast to increase only 1.1 percent for the year despite slow traffic growth. For the balance of the forecast real yield declines averaging one percent per year are projected. Nominal yield reaches 10.08 cents by 2014--an increase of 1.3 percent a year.

Passenger Trip Length

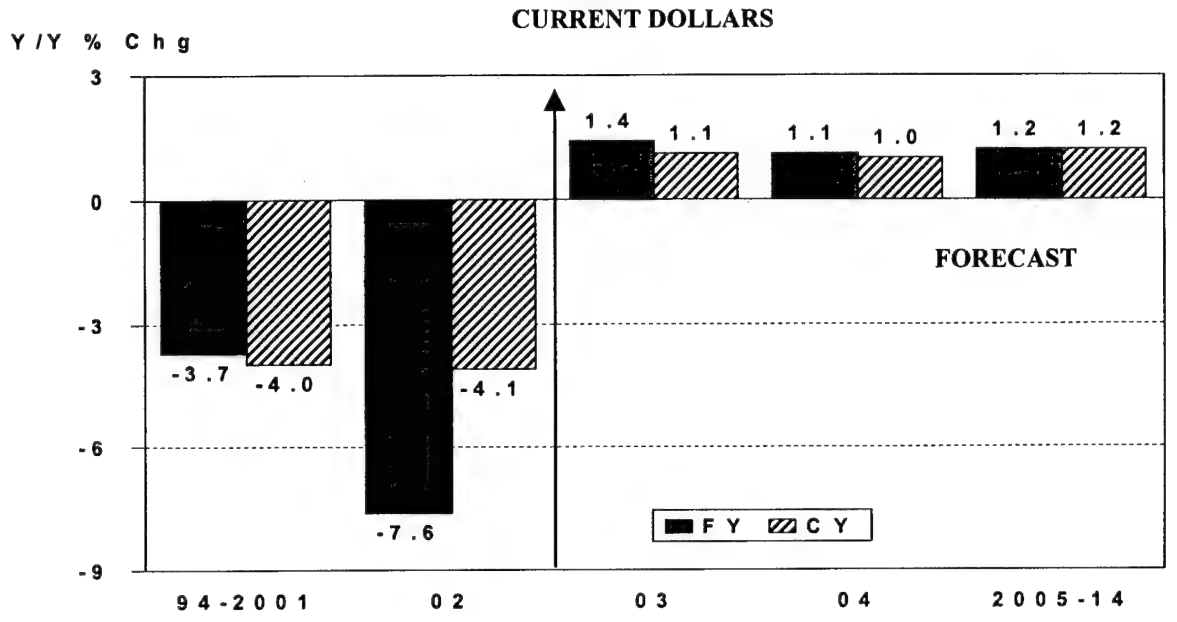
Following a very small increase of 8.9 miles in 2001, passenger trip length in Pacific markets increased 74.8 miles in 2002 to 5,303.7 miles. Passenger trip length was up during the 1st half of the year, but turned negative beginning in April. The downturn in passenger trip length is projected to continue through the 1st half of 2003, then turn positive for the balance of the year. For the year passenger trip length is projected to decrease 25.4 miles. As capacity is added back to the region and carriers increase their flying from non-coastal gateways, the average trip length is forecast to increase 57.5 miles in 2004. For the remainder of the planning period—2005 through 2014--slight increases in trip length are expected. During this period, the average trip length increases 2.3 miles a year, primarily due to more direct flights and expanded service into the Asia/Pacific region. For the 12-year forecast period, the Pacific market trip length increases 58.0 miles from 5,303.7 to 5,361.7 miles.

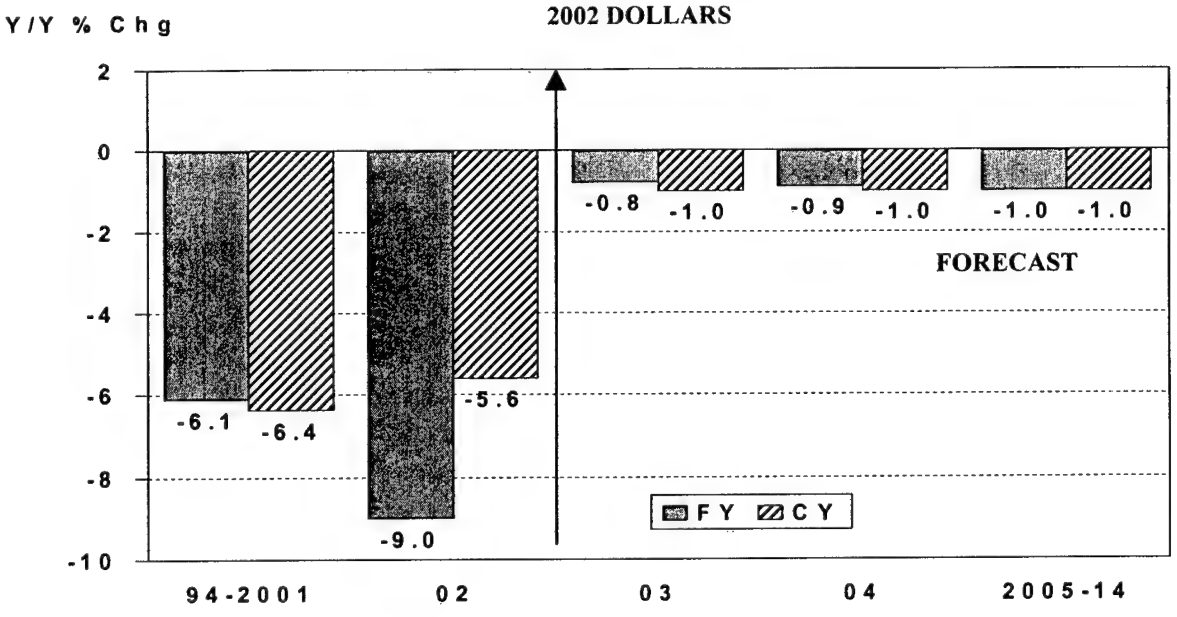
Average Aircraft Size

Following a decrease of 3.6 seats in 2001, the average aircraft size in the Pacific market fell from 304.1 seats to 294.6 seats in 2002, the smallest average seat size in the region since 1988. The primary cause of the decline in seat size was the reduction in B-747 capacity by United following the events of September 11th.

Based on OAG schedules, little change in average seat size is projected for 2003, although there is a good possibility for additional reductions in B-747 capacity as United attempts to reorganize and emerge from bankruptcy. Average seat size in 2003 is forecast to decrease by 0.1 seats to 294.5 seats and then grow slowly for the balance of the forecast. By 2014 the

U.S. COMMERCIAL LARGE AIR CARRIERS: PACIFIC PASSENGER YIELD





average aircraft size is forecast be 300.5 seats, up 5.9 seats from the 2002 average seat size.

Passenger Load Factor

In 2002 load factor in the Pacific market increased 2.3 points to 77.5 percent as traffic decreased 17.6 percent while capacity decreased 20.0 percent. Following a 9.5 point drop in load factor in the 1st quarter, load factor was up by 9.4 points in the 2nd quarter. Load factor remained strong for the balance of the year, up 4.5 points versus 2001.

Load factor is forecast to increase modestly to 77.8 percent in 2003 as traffic increases faster than capacity in the region. Year-over-year load factor increases are projected for the 1st and last quarters of the year. Load factor in the region is projected to decline one point in 2004 to 76.8 percent. As traffic returns to its long-term growth path from 2004 to 2006, the load factor increases steadily to 77.5 percent by 2006. The load factor is projected to remain at 77.5 percent for the period 2006 through 2014 as ASMs and RPMs expand at the same rate.

Forecasts

Total Passengers: U.S. and Foreign Flag Carriers

Based on INS data, total passengers in the Pacific market decreased 11.4 percent in CY 2001 following an increase of 7.0 percent in 2000. However for the first time since 1991, U.S. air carrier's market share rose from 39.1 percent to 39.7 percent in 2001.

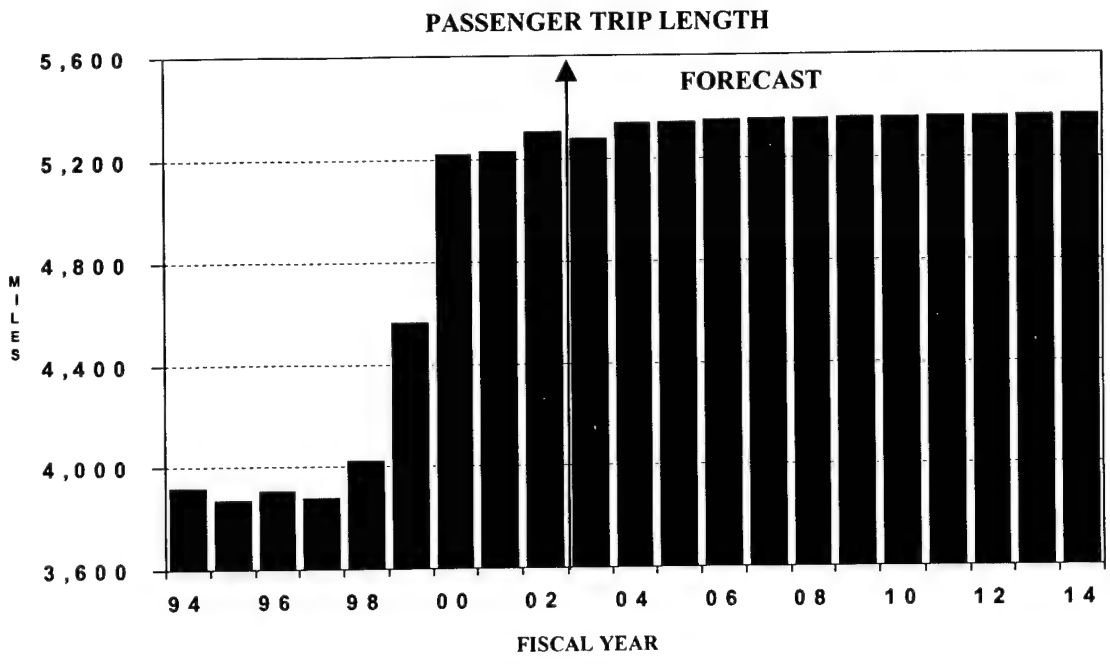
Preliminary data for 2002 indicate that the decline in traffic is subsiding. Passengers are projected to decline 2.4 percent during the year. For CY 2002 to 2004, it is assumed that passenger growth in the Pacific market will exceed that of U.S. flag carriers in the market. Passengers are forecast to increase 4.2 percent in 2003 with the largest increases occurring in the 1st half of the year.

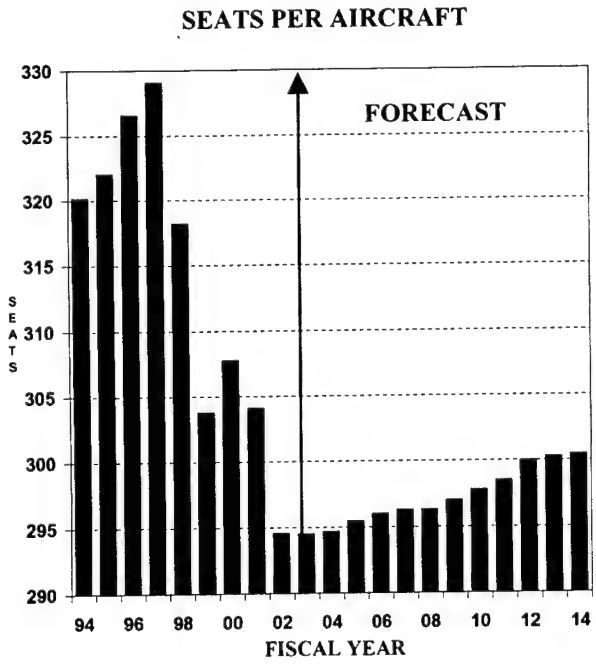
Passengers are projected to grow 4.0 percent in 2004 with growth slowest during the 1st quarter of the year, then picking up through the summer quarter. For the period 2005 to 2014, passengers are forecast to increase an average of 5.0 percent per year. Total passengers increase from 22.4 million in 2002 to 39.9 million in 2014, an average of 4.9 percent per year.

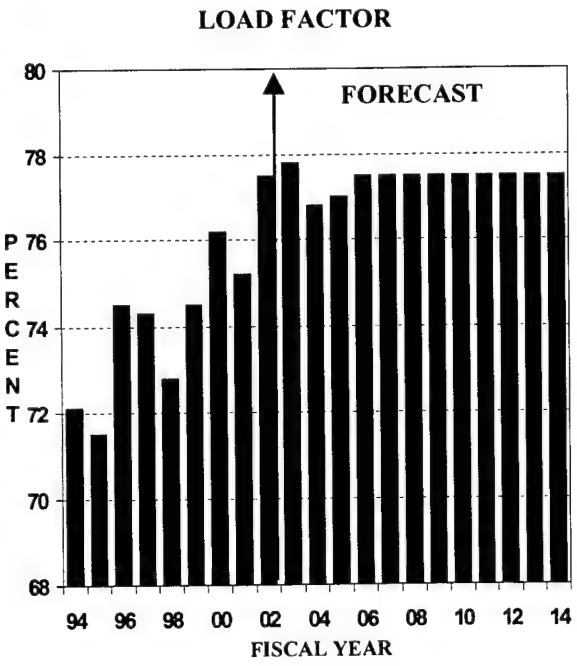
U.S. Large Carrier Passenger Enplanements

U.S. scheduled large air carriers in the Pacific market enplaned a total of 9.2 million passengers in 2002, down 18.7 percent following a 1.6 percent increase in 2001. Enplanements were down sharply versus prior year levels throughout the year until September, when the prior year levels were impacted by the terrorist attacks. In 2003 passengers are forecast to be up 4.5 percent with the largest increases forecast for the 1st quarter. Passengers are forecast to increase 0.9 percent in 2004 with declines in the 1st half of the year and increases in the 2nd half. For the period 2005 to 2014, passengers are projected to increase an average of 5.0 percent annually. Enplanement growth is projected to average 4.7 percent annually during the 12-year forecast period, with Pacific market enplanements reaching 16.0 million in 2014.

U.S. COMMERCIAL LARGE AIR CARRIERS: PACIFIC OPERATIONAL VARIABLES







U.S. Large Carrier
Revenue Passenger Miles

Traffic in the Pacific market decreased 17.6 percent in 2002, following a 1.8 percent increase in 2001. The declines were sharpest in the 1st quarter, then leveled during the next 2 quarters before diminishing significantly in the summer quarter, which was boosted in large part by the 19.8 percent gain in September. Growth is projected to continue in the region in 2003 with RPMs up 4.0 percent spurred by large increases in the 1st quarter. Traffic growth is forecast to slow to 2.0 percent in 2004 with rates accelerating throughout the year. RPMs for the Pacific market are forecast to increase an average of 5.0 percent per year from 2005 to 2014 as the economies of the region return to their long-term historical growth. The average annual increase in RPMs over the 12-year forecast is 4.8 percent, with RPMs totaling 85.7 billion in 2014.

U.S./CANADA TRANSBORDER TRAFFIC

The transborder forecasts shown in this document (Chapter X, Table 10) were developed in conjunction with Transport Canada and FAA's projections of expected growth in this market.

In CY 1995, the U.S. and Canada signed an open-skies agreement. Between 1995 and 1998, transborder traffic grew 8.8 percent a year. Transborder traffic growth moderated somewhat in 1999 and 2000, increasing at rates of 3.5 and 6.8 percent, respectively. Transborder traffic fell in 2001 as the weak economies in both the U.S. and Canada, as well as the events of September 11th, resulted in a decline of 6.4 percent. Passengers are projected to continue to decline in 2002, falling another 7.8 percent before modestly rebounding in 2003 when growth of 5.6 percent is forecast. For the 12-year forecast period transborder traffic increases from 17.9 million in CY 2002 to 26.3 million in 2014--an average of 3.2 percent a year.

AIR CARGO

Air cargo traffic is comprised of domestic and international revenue freight/express and mail. The demand for air cargo transportation is a derived demand resulting from economic activity. Cargo is moved in the bellies of passenger aircraft and in dedicated all-cargo aircraft, on both scheduled and nonscheduled service.

In 2002[6], the total number of domestic and international air cargo RTMs flown by U.S. commercial air carriers was 26.6 billion. The top five carriers accounted for more than two-thirds of this total. The top five carriers in terms of RTMs and their percentage shares were: FedEx (31.4 percent), United Parcel Service (15.5 percent), United Airlines (8.1 percent), Northwest Airlines (7.9 percent), and American Airlines (7.2 percent).

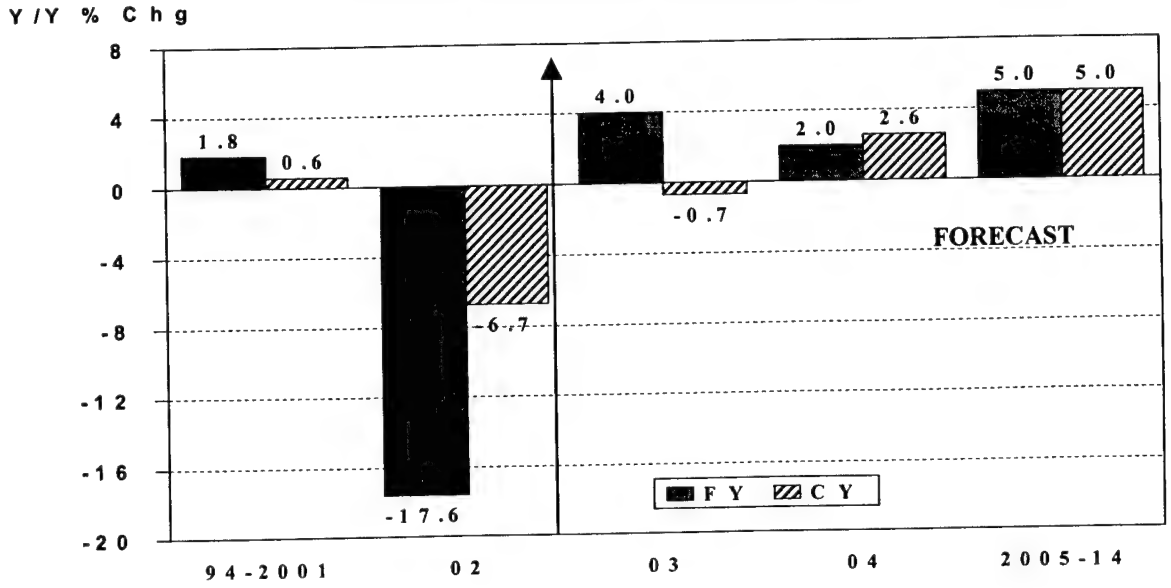
HISTORIC FREIGHT/EXPRESS TONNAGE

Historic data were derived for domestic and international freight/express tonnage. The domestic figures represent enplaned domestic cargo tons at U.S. airports on U.S. commercial air carriers and that reported by U.S. regional/commuter carriers. These data were

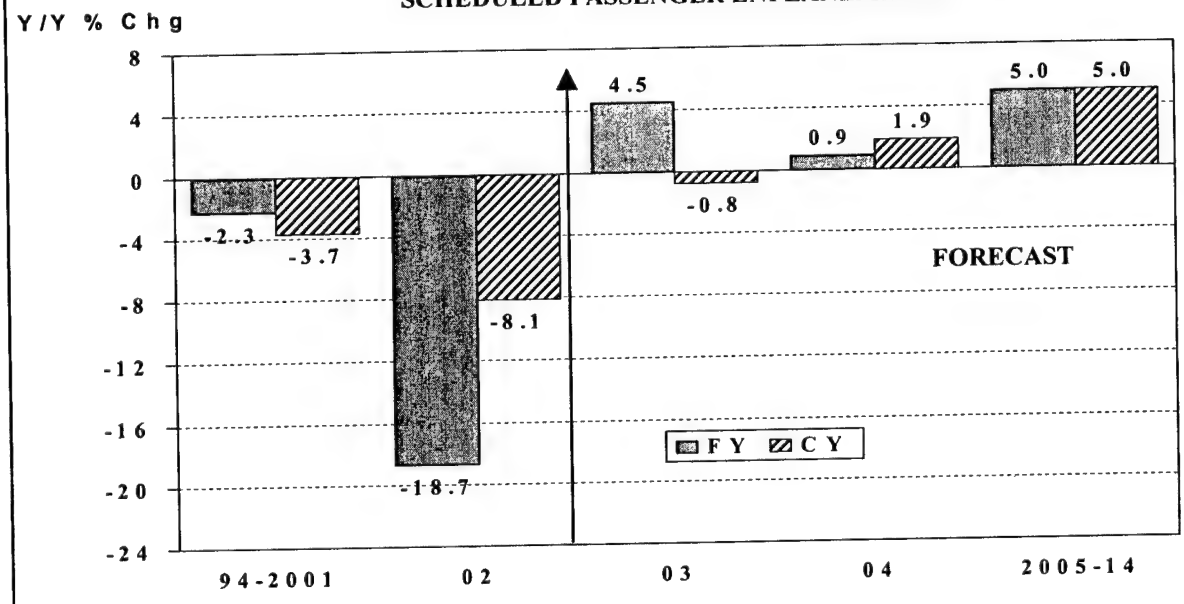
[6] 12 months ending June 2002

U.S. COMMERCIAL LARGE AIR CARRIERS: PACIFIC FORECASTS

SCHEDULED REVENUE PASSENGER MILES



SCHEDULED PASSENGER ENPLANEMENTS



compiled on a calendar year basis using the DOT Onboard T3 and T100 databases.[7] Enplaned domestic cargo tonnage grew from 7.6 million tons in 1994 to 12.7 million tons in 2001, an average annual increase of 7.6 percent. The 2001 level represents a 6.3 percent decrease from the 13.5 million tons enplaned in 2000.

The international figures are enplaned and deplaned international cargo tonnage at U.S. airports on U.S. and foreign flag carriers and that reported by U.S. regional/commuter carriers. These data were compiled on a calendar year basis using the DOT International T100 database. International cargo tonnage on U.S. and foreign flag carriers grew from 5.5 million tons in 1994 to 7.3 million tons in 2001, an average annual increase of 4.1 percent. The 2001 level represents a decrease of 7.5 percent from 7.9 million tons in 2000. The U.S. flag carrier portion of the total international tonnage has increased from 43.6 percent in 1994 to 47.8 percent in 2001. The distribution of total tonnage for U.S. and foreign flag carriers by world region in 2001 was: Atlantic (39.1 percent), Pacific (35.8 percent), Latin America (21.9 percent), and Canada (3.2 percent).

REVENUE TON MILES

Historic data and forecasts are presented for domestic and international cargo RTMs. In addition, within each of these two components trends and forecasts are presented for all-cargo carriers and passenger carriers. Passenger carriers transport cargo predominantly in the bellies of their aircraft.

The forecast of cargo RTMs could not be further disaggregated into freight/express and mail components due to a reporting problem in the historic data. FedEx is reporting their activity under a contract with the U.S. Postal Service as freight/express, rather than as mail. This reporting, which began in August 2001, affects the consistency of the historic distribution between freight/express and mail RTMs.

Industry Structure and Market Assumptions

Historically, air cargo activity has been highly correlated with GDP. Additional factors that have affected the growth in air cargo traffic include declining real yields, improved productivity, and globalization. Ongoing trends that could potentially stimulate demand for air cargo include increased market opportunities from open skies agreements, decreased costs from global airline alliances, and increased business volumes attributable to e-commerce. Ongoing trends that could potentially limit growth include increased use of e-mail, decreased costs of sending documents via facsimile, and the increased costs to airlines in meeting environmental and security restrictions.

Significant structural changes have occurred in the air cargo industry. Among these changes are the following:

- *FAA security directive*
  In October, 2001 the FAA issued a new security directive under 14 CFR Part 108 to strengthen security standards for transporting cargo on passenger flights. This directive, which exempts all-cargo flights, was in response to the September terrorist attacks. This significantly impacted air cargo activity in 2002, including a shift from passenger carriers to all-cargo carriers.

- *Residual fear of mail due to terrorism*
  This affects mail volume and will likely increase the use of substitutes (e.g., e-mail).

[7] The domestic estimates include some transborder tonnage to Canada that is not reported separately.

- *Reduced airline schedules*
  This will affect freight/express in particular by decreasing the available capacity.

- *Modal shift from air to other modes (especially truck)*
  This shift is likely to be accelerated by the additional costs associated with air service resulting from increased security. The modal shift is occurring for the integrated carriers (e.g., FedEx and United Parcel Service) and for the U.S. Postal Service.

- *Increased use of all-cargo carriers (e.g., FedEx) by the U.S. Postal Service to transport mail*
  This trend may also be accelerated due to security considerations.

The forecasts of RTMs are predicated on several basic assumptions. These assumptions include the following: 1) FAA security restrictions concerning cargo transportation on passenger carriers will remain in place; 2) there will be no additional terrorist attacks in the U.S. and confidence in flying will return; 3) there will be modest domestic and international economic growth in 2003 followed by recovery in 2004; 4) in the near-term modal shifts from air to ground and from passenger carriers to all-cargo carriers will continue; and 5) in the long-term cargo activity will be tied to economic growth and airline schedules will return to more normal levels. Specific factors and assumptions affecting the domestic and international components of air cargo activity are noted in the following section.

The forecasts of cargo RTMs were prepared by considering the changes in industry structure and market assumptions discussed above. The near-term forecasts were also based, in part, on a consideration of economic conditions and discussions with industry representatives. These discussions included talks with cargo carriers and cargo consultants as well as input from the Air Cargo Panel of the FAA/TRB 12th International Workshop on Future Aviation Activities. The long-term forecasts of RTMs were based primarily on regressions with GDP. Forecasts of domestic cargo RTMs were developed from a regression equation using real U.S. GDP as the independent variable. Projections of international cargo RTMs were derived from an equation based on world GDP, adjusted for inflation. The distribution of RTMs between passenger carriers and all-cargo carriers was forecast based on an analysis of historic trends in shares; the changes in industry structure and market assumptions; and discussions with industry representatives.

From 1994 to 2002, total cargo flown on U.S. commercial air carriers increased from 20.8 billion to 27.3 billion RTMs. This growth, which averaged 3.5 percent per year, was faster than the rate of growth in passengers. Domestic and international cargo RTMs grew an average of 1.9 percent and 5.2 percent, respectively, between 1994 and 2002. The slow domestic growth largely reflects the relative maturity of the U.S. cargo market.

Growth in domestic cargo RTMs has been dominated by all-cargo carriers. These carriers have significantly increased their market share, accounting for nearly three-quarters of domestic cargo RTMs in 2002. FedEx and United Parcel Service are the two largest domestic all-cargo carriers. Both of these carriers are integrated carriers who provide door-to-door service using intermodal systems.

Revenue Ton Miles Forecast

The total number of air cargo RTMs flown by U.S. commercial air carriers was 27.3 billion in 2002, a decrease of 4.0 percent from 2001. This decrease reflects the continued slow growth in domestic and worldwide economic activity in 2002. Furthermore, cargo activity is a leading economic indicator and thus reflects the modest economic growth projected for 2003.

Total RTMs are forecast to increase 4.6 percent in 2003 and 4.7 percent in 2004. Over the 10-year period from 2005 to 2014, total RTMs are forecast to increase at an average annual rate of 5.0 percent, based primarily on economic growth. The forecast level of 49.0 billion RTMs in 2014 represents an average annual increase of 5.0 percent over the entire forecast period.

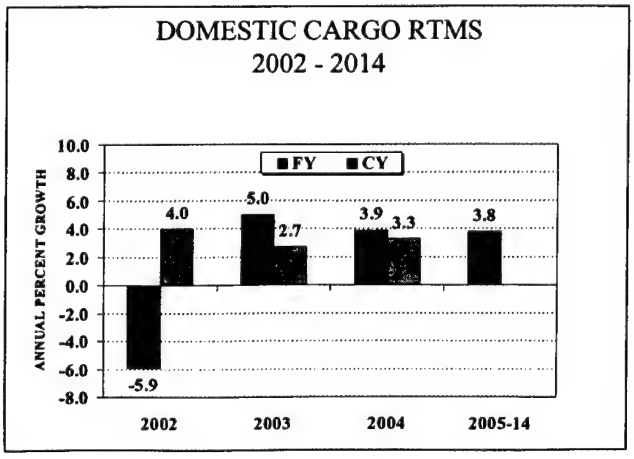
Domestic Revenue Ton Miles[8]

Domestic cargo RTMs flown by U.S. commercial air carriers were 13.1 billion in 2002, a 5.9 percent decrease from 2001. This decrease was due to the slow economic growth in the U.S. and continued weakness in the technology sector. Domestic cargo RTMs are forecast to increase 5.0 percent in 2003 as a result of improvements in the economy and a return to growth from a depressed base. Domestic cargo RTMs are forecast to increase 3.9 percent in 2004 and 3.7 percent in 2005 based on economic recovery and a continuation of the modal shift from air to other modes (e.g., truck). Over the 10-year period from 2005 to 2014, domestic cargo RTMs are forecast to increase at an average annual rate of 3.8 percent, based on projected growth in U.S. GDP. The forecast level of 20.8 billion RTMs in 2014 represents an average annual increase of 3.9 percent over the entire forecast period.

Both the freight/express and mail components of domestic cargo will continue to be impacted in the near term by the intermodal shift from air to ground transportation. For both components, this has resulted from the ability of carriers to provide ground transportation at a relatively lower price for distances up to 1,000 miles. In addition, this relative cost of providing transportation is likely to be impacted by increased air transportation costs to meet the FAA security directive.

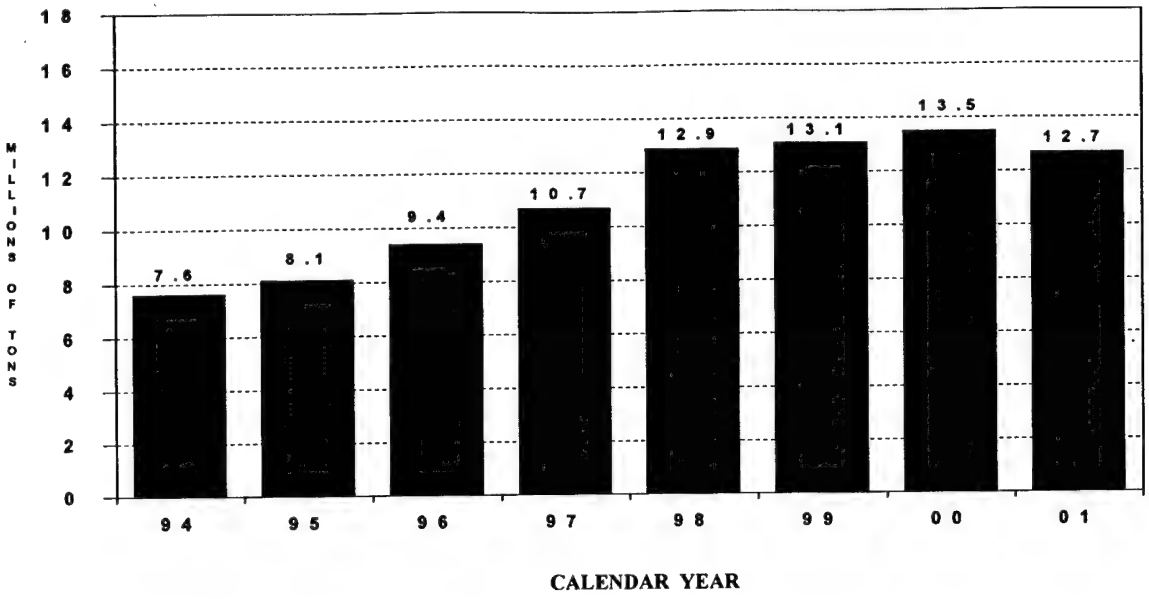
The freight/express component of domestic air cargo is highly correlated with capital spending. Consequently, the growth of this component in the future will be tied to improvements in the economy. The mail component of domestic air cargo will be affected by overall mail volume, which is related to the economy. This component will also be impacted by residual fear related to terrorism and the increased use of substitutes (e.g., e-mail).

Historically all-cargo carriers have increased their share of domestic cargo RTMs flown, from 58.9 percent in 1994 to 74.0 percent in 2002. This has resulted from the significant growth of express service by FedEx and United Parcel Service and the lack of growth of domestic freight/express business for passenger carriers. In addition, the U.S. Postal Service has increased its use of all-cargo carriers as a means to improve control over mail delivery. The all-cargo share is forecast to increase to 74.7 percent in 2003 as a result of the FAA security directive, capacity reductions attributable to United and US Airways operations under Chapter 11 bankruptcy, and restructuring of the passenger carriers. The all-cargo share is forecast to increase to 78.3 percent by 2014 based largely on the faster growth of the freight/express component relative to the mail component.

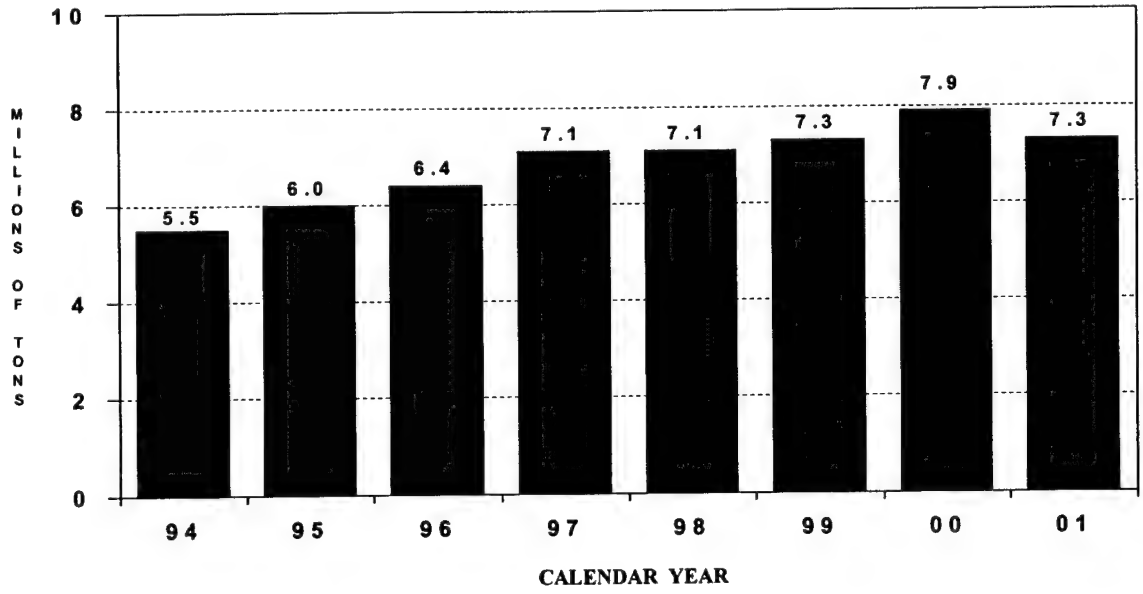


[8] For the 12 months ending July 2001, domestic cargo RTMs were comprised of 83.6 percent freight/express and 16.4 percent mail. Therefore, the domestic cargo RTM forecast discussed below is driven largely by factors that impact domestic freight/express.

ENPLANED DOMESTIC CARGO TONS

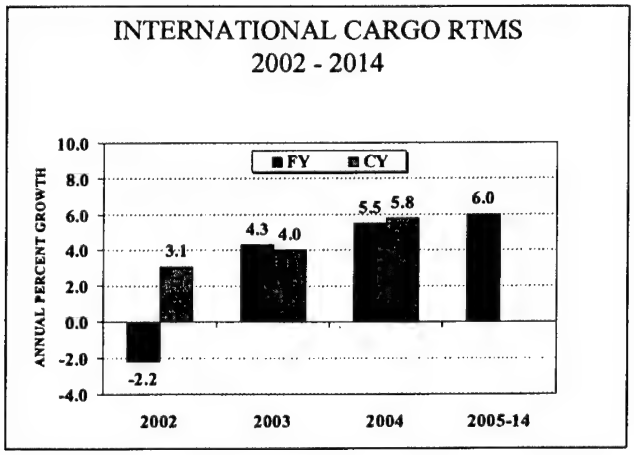


ENPLANED/DEPLANED INTERNATIONAL CARGO TONS AT U.S. AIRPORTS



International Revenue Ton Miles[9]

International cargo RTMs flown by U.S. commercial air carriers were 14.2 billion in 2002, a decrease of 2.2 percent from 2001. This decline was due to the modest economic growth of world GDP. International cargo RTMs are forecast to increase 4.3 percent in 2003 due to improvements in the world economy and increased schedules for passenger carriers. However, the growth may vary by world region depending on regional economic activity, the predominance of individual carriers, and the impact of restructuring by United. International cargo RTMs are forecast to increase 5.5 percent in 2004 and 6.8 percent in 2005 based primarily on economic growth. Over the 10-year period from 2005 to 2014, international cargo RTMs are forecast to increase at an average annual rate of 6.0 percent based on projected growth in world GDP. The forecast level of 28.1 billion RTMs in 2014 represents an average annual increase of 5.8 percent over the entire forecast period.



Both the freight/express and mail components of international cargo will be affected by economic growth. The mail component will also be affected by some residual fear of terrorism as well as improvements in mail delivery services.

All-cargo carriers increased their share of international cargo RTMs flown from 44.2 percent in 1994 to 53.6 percent in 2002. The all-cargo share is forecast to increase to 55.6 percent by 2014 due to increased demand for expedited service and the faster growth of the freight/express component relative to the mail component.

AIR CARRIER FLEET

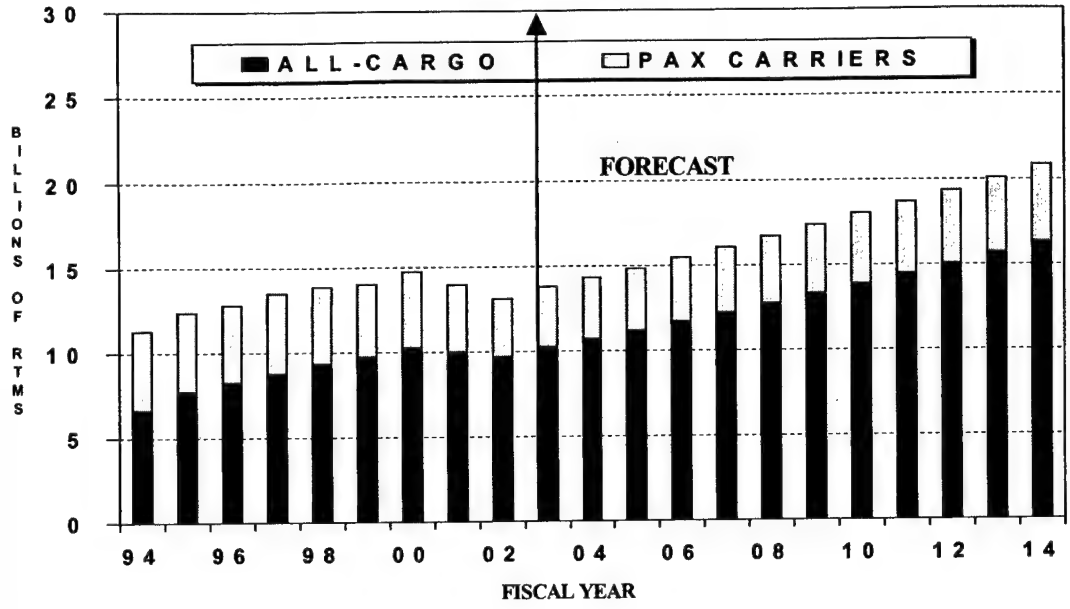
U.S. air carriers placed orders for an estimated 682 jet aircraft during CY 2001 signaling an end to the boom in aircraft orders that began in 1996. Although the 682 orders were the fifth highest total in history, it represented a 53.4 percent decline from the prior year total. Between 1965 and 2000, the average number of orders per year was 308.

In 2001 orders for regional jets exceeded narrow body two-engine aircraft. Regional jet orders (CRJs, EMBs, and Fairchild/Dornier) totaled for 302 aircraft (44.3 percent) while orders for narrowbody two-engine aircraft (A-318/319/320/321 and B-717/737/757) totaled 262 (38.4 percent). Orders for two-engine (A-300/330 and B-767/777) widebody aircraft totaled 100 (14.7 percent) in 2001.

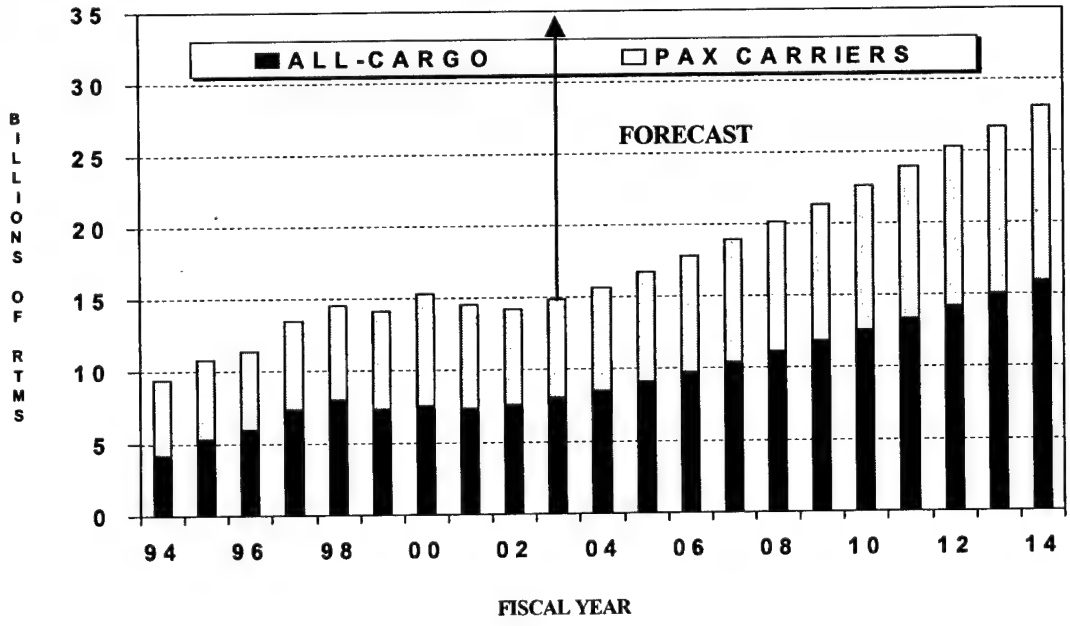
[9] For the 12 months ending July 2001, international cargo RTMs were comprised of 96.5 percent freight/express and 3.5 percent mail. Consequently, the international cargo RTM forecast discussed below is overwhelmingly driven by factors that impact international freight/express.

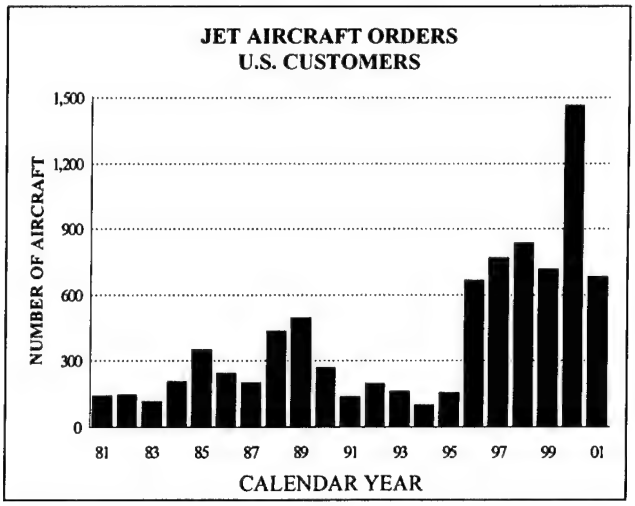
U.S. COMMERCIAL AIR CARRIERS: CARGO REVENUE TON MILES

DOMESTIC

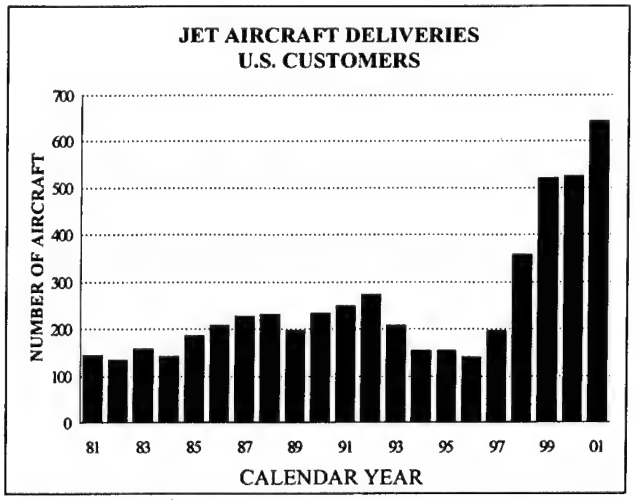


INTERNATIONAL





Aircraft manufacturers delivered 643 jet aircraft to U.S. customers in CY 2001--the largest number of deliveries ever. Of this total, 346 (53.8 percent) were two-engine narrowbody aircraft, 59 (9.2 percent) were for two-engine widebody aircraft, and 237 were for regional jets (36.9 percent).



Passenger Jet Aircraft

In CY 2002, the fleet of passenger jet aircraft for U.S. air carriers increased by an estimated 39 aircraft, the first smallest increase in the fleet since 1992. Three categories had net increases: two-engine widebody aircraft (up 16 or 3.5 percent), four-engine narrowbody aircraft (up 5 or 45.5 percent) and regional jets (up 194 aircraft or 24.8 percent).

Based on the backlog of aircraft orders and the projections of air carrier traffic, seat capacity, load factors, fleet requirements, and aircraft productivity, the U.S. commercial air carrier passenger fleet is projected to increase from an inventory of 5,156 aircraft in 2002 to 8,095 aircraft by 2014. This involves a net addition to the fleet (after retirements of obsolete aircraft) of approximately 245 aircraft annually.

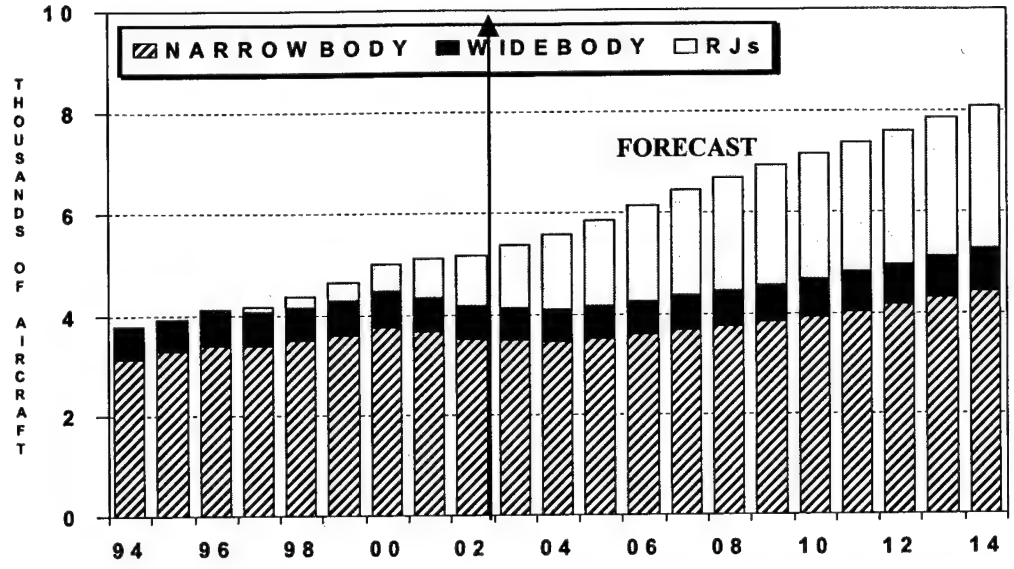
The two-engine narrowbody fleet is projected to grow by an average of 80 aircraft annually. By 2014, two-engine narrowbody aircraft are expected to account for 53.4 percent of the fleet. The number of three-engine narrowbody (B-727) aircraft declines from 142 aircraft (2.8 percent of fleet) in 2002 to 103 (1.3 percent of fleet) by 2014. Despite growing in 2002, the number of four-engine narrowbody aircraft declines from 16 aircraft in 2002 to 0 by 2004 and remains at that level throughout the balance of the forecast.

The fleet of two-engine widebody aircraft (A-300/310/330 and B-767/777) is the fastest growing of the widebody group. This group is expected to increase by an average of 21 aircraft per year (3.5 percent), expanding from 477 aircraft in 2002 to 723 aircraft in 2014. The three-engine widebody fleet (MD-11, DC-10, and L-1011) is projected to shrink at an average annual rate of 8.0 percent, from 92 aircraft in 2002 to 34 aircraft in 2014.

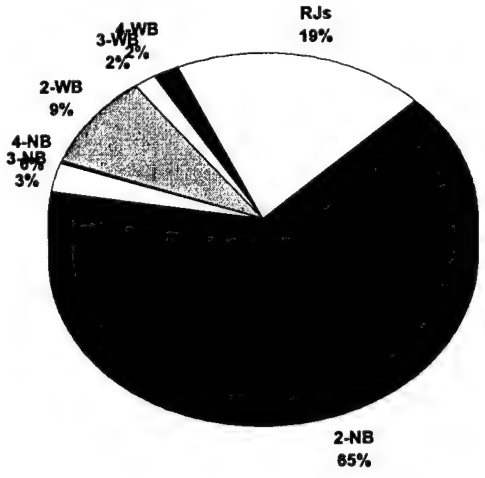
Four-engine widebody (B-747 and A-340) aircraft are forecast to decline from 92 aircraft in 2002 to 78 aircraft in 2014, an annual average decrease of 1.0 percent

The regional jet fleet consisting of aircraft ranging in size from 35 to 70 seats, is forecast to expand from 976 aircraft in 2002 to 2,834 aircraft in 2014, an increase of 9.3 percent a year. By 2014 the regional fleet will account

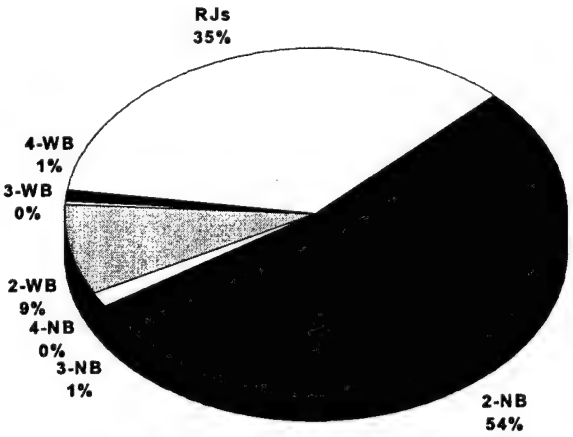
U.S. COMMERCIAL AIR CARRIERS: PASSENGER JET AIRCRAFT



PERCENT BY AIRCRAFT TYPE



2002



2014

for 35.0 percent of the total passenger jet fleet; in 2002 the regional jet fleet accounted for only 24.8 percent of the fleet.

Cargo Jet Aircraft

In CY 2002, the jet fleet of U.S. air carrier cargo aircraft decreased by 0.5 percent to 1,034 aircraft. Based on the backlog of aircraft orders and the projections of air cargo demand, the U.S. commercial cargo fleet is projected to increase to 1,547 aircraft by CY 2014. This involves an average net addition to the fleet (after retirements of obsolete aircraft) of 43 aircraft annually or 3.4 percent per year.

Narrowbody aircraft, which accounted for 55.8 percent of the cargo fleet in 2002, are projected to account for 34.8 percent in 2014. The fleet of two-engine and four-engine narrowbody aircraft remains relatively constant over the forecast period. Narrowbody two-engine aircraft total 160 in 2002 and 159 in 2014, while narrowbody four-engine aircraft total 128 in 2002 and 125 in 2014.

The number of three-engine narrowbody aircraft decrease during the forecast period. Narrowbody three-engine aircraft decrease from 289 aircraft in 2002 to 255 aircraft in 2014.

Widebody aircraft accounted for 44.2 percent of the cargo fleet in 2002. The fleet of widebody aircraft is forecast to increase to 65.2 percent of the cargo fleet in 2014. The largest increase in the number of widebody aircraft is projected to occur in the two-engine widebody category. This category grows an average of 32 aircraft per year (9.2 percent annually), expanding from 206 aircraft in 2002 to 590 aircraft in 2014.

The three-engine widebody fleet is projected to increase an average of 8 aircraft, or 3.6 percent, over the forecast period from 183 aircraft in 2002 to 279 aircraft in 2014. Conversions of DC-10 passenger aircraft to MD-10's and new MD-11F orders drive the growth in this category. The four-engine widebody aircraft fleet increases an average of 6.1 percent per year, from 68 aircraft in 2002 to 139 aircraft in 2014. Unlike last year's forecast, the current forecast does assume a number of A380's entering the U.S. fleet beginning in 2008.

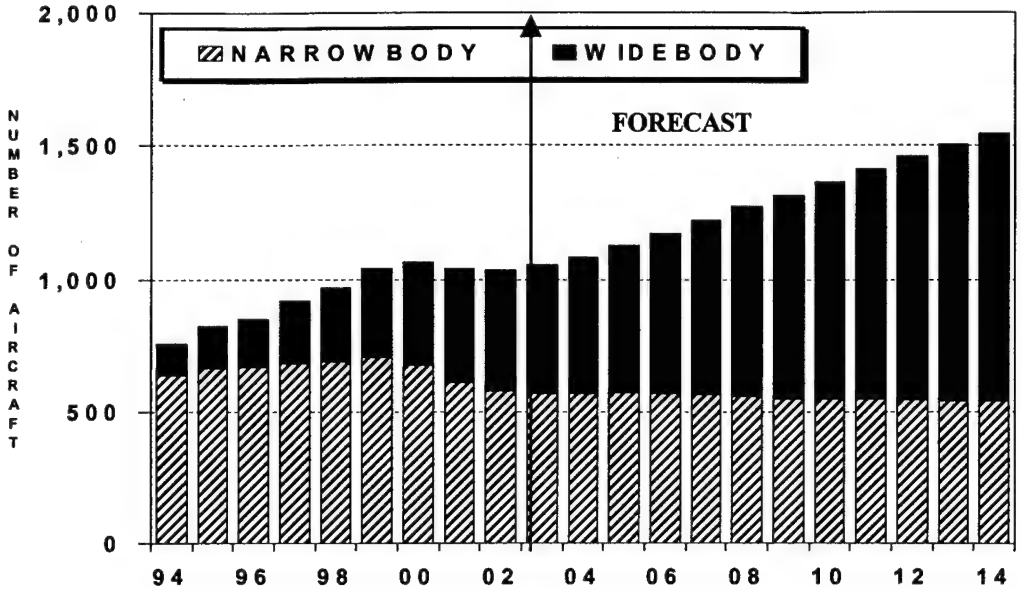
AIRBORNE HOURS

U.S. large commercial air carriers (passenger and cargo but excluding regional jets) flew an estimated total of 12.9 million hours in 2002, down from 14.4 million hours in 2001. The decrease in hours was driven by decreases in activity following the September 11th terrorist attacks. More than 88 percent of total airborne hours were accounted for in two aircraft categories: two-engine narrowbody (73.3 percent), and two-engine widebody (14.9 percent).

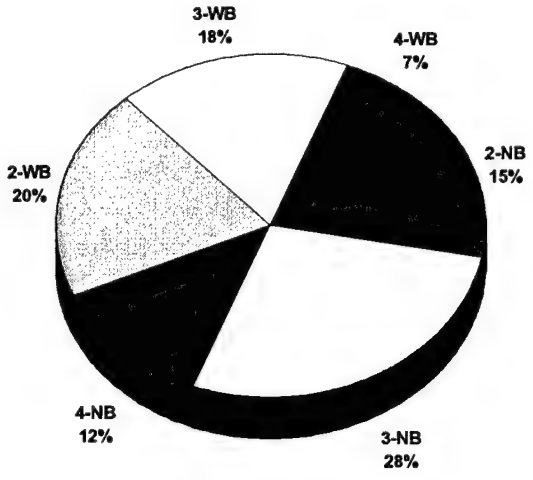
In 2014, the total number of hours is forecast to expand to 18.7 million, an average annual increase of 3.1 percent. Airborne hours are projected to decrease 0.9 percent in 2003 to 12.8 million, and then increase 3.1 percent in 2004, to 13.2 million.

Two-engine aircraft (both narrowbody and widebody) are expected to account for 92.0 percent of all airborne hours flown in 2014. Narrowbody two-engine aircraft hours, which make up 70.8 percent of total hours in 2014, increase, on average, 2.8 percent per year. Widebody two-engine aircraft hours, which account for 21.2 percent of total hours in 2014, increase 6.2 percent per year. Four-engine widebody aircraft hours flown are forecast to increase at an average annual rate of 2.7 percent.

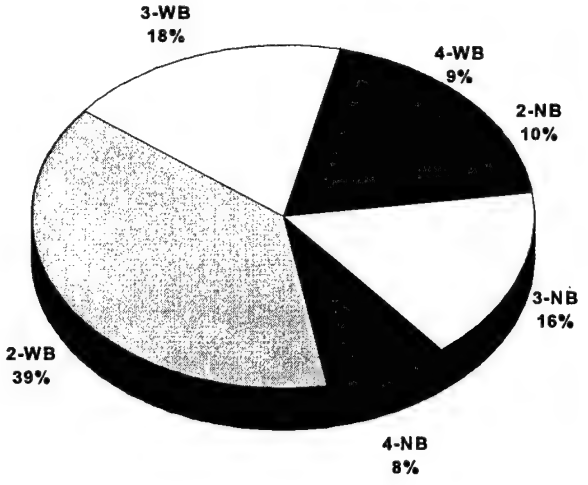
U.S. COMMERCIAL AIR CARRIERS: CARGO JET AIRCRAFT



PERCENT BY AIRCRAFT TYPE

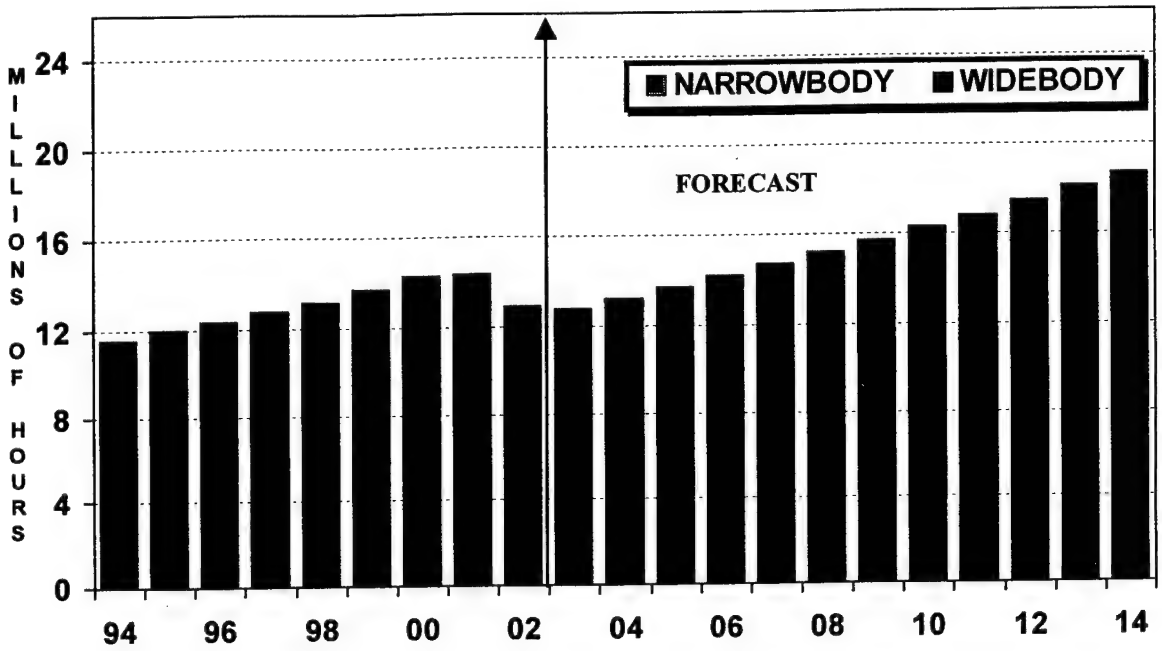


2002

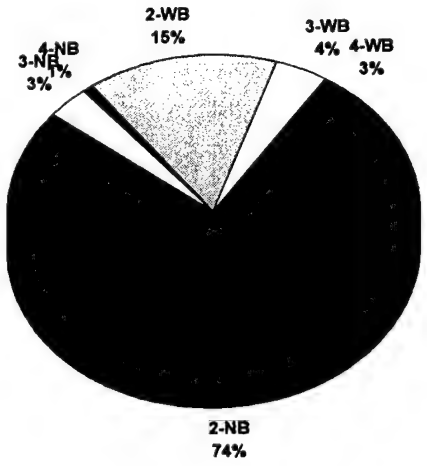


2014

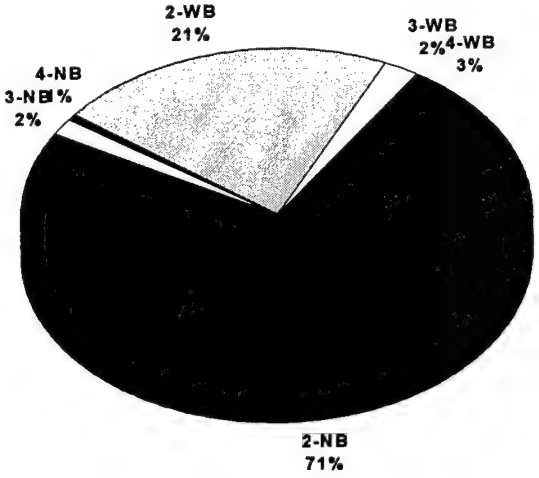
U.S. COMMERCIAL AIR CARRIERS: AIRBORNE HOURS 1/



PERCENT BY AIRCRAFT TYPE



2002



2014

1/Includes both passenger (excluding regional jets) and cargo aircraft.

The number of hours flown by three-engine aircraft is projected to decline through 2014. Three-engine widebody hours flown are forecast to decrease 1.3 percent a year. Although the fleet of three engine widebody aircraft is forecast to increase, the growth in this fleet is with cargo operators. Cargo utilization rates for hours are typically lower than utilization rates for passenger applications. Three-engine narrowbody aircraft hours are forecast to fall 2.9 percent annually, reflecting the retirement of B-727 aircraft and the increasing proportion of cargo aircraft in this fleet. The share of total hours flown by three-engine aircraft will decrease from 7.6 percent in 2002 to 4.1 percent in 2014. Hours for the four-engine narrowbody fleet, made up primarily of DC-8 cargo aircraft, decrease at a rate of 1.2 percent a year, reflecting the retirement of these aircraft from the fleet.

CHAPTER IV
REGIONALS/COMMUTERS

CHAPTER IV

REGIONALS/COMMUTERS

For purposes of the Federal Aviation Administration (FAA) forecasts, air carriers that are included as part of the regional/commuter airline industry meet two criteria. First, a regional/commuter carrier flies a majority of their available seat miles (ASMs) using aircraft having 70 seats or less. Secondly, the service provided by these carriers is primarily regularly scheduled passenger service.

During 2002, 79 regional/commuter airlines met this definition and reported traffic statistics to the Department of Transportation (DOT) on either Form 41 (10 carriers)[1] or Form 298C (69 carriers). However, starting in October 2002, all Part 121 regional/commuter airlines (carriers operating aircraft with over 10 seats) reported traffic on a monthly basis using Form 41. Part 135 airlines (carriers operating aircraft with 10 or less seats) will continue to report their traffic quarterly using Form 298-C.

[1] Air Wisconsin, American Eagle, Atlantic Southeast, Chicago Express, Comair, Executive, ExpressJet (formerly Continental Express), Horizon, Mesaba, and Trans States.

REVIEW OF 2002[2]

The regional/commuter industry's results for 2002 reflect the strong impact that the terrorist attacks of September 11th had on the operations of the large air carriers. While the large air carriers have suffered two years of negative growth in traffic since the attacks, the regionals/commuters have continued to post gains in both capacity and traffic. History has shown that the regional/commuter industry endures periods of uncertainty better than the large air carriers. During the oil embargo of 1973, the recession in 1990, and the Gulf War in 1991, the regional/commuter industry has consistently outperformed the larger air carriers.

To survive downturns in the demand for aviation services, large air carriers cut capacity to reduce costs. Code-sharing agreements (or equity ownership of one partner in another) allow large air carriers to get feeder traffic from the regionals/commuters on routes that cannot support the use of larger aircraft. Traditionally, regionals have responded to large carrier cuts in capacity by matching aircraft size to market demand. Past periods of reduced demand saw

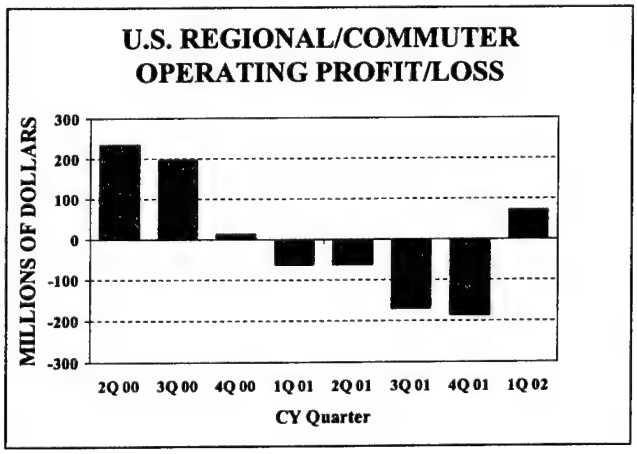
[2] All specified years in this chapter are fiscal year (October 1 through September 30) unless designated otherwise.

regionals primarily taking over thin, short-haul markets. During 2002, however, regionals not only took over short-haul routes, but medium- to longer-haul routes as well. This is occurring due to range and speed of the ever-increasing number of 50- to 70-seat regional jets that are entering the fleet.

FINANCIAL RESULTS

For the 12 months ended March 2002, the regional/commuter industry posted an operating loss of $346.6 million. This compares to an operating profit of $384.0 million for the same period 12 months earlier. The majority of the losses occurred from July through December of 2001. Operating losses during these 6 months totaled $356.2 million. During FY 2001, operating losses for the industry totaled $282.6 million.

The first quarter of calendar year 2002 showed a return to profitability for the industry. Operating profits during this quarter were $72.5 million. Preliminary data indicates that the second and third quarters of FY 2002 could be profitable as well.



Operating revenues for the 12-months ended March 2002 were $8.6 million, a 3.0 percent drop from the previous year. Operating expenses during the same period were $8.9 million, an increase of 5.5 percent from the previous 12-month period.

Nominal yield for the industry during the 12-month period ending March 2002 was 29.42 cents. This is a decline of 10.2 percent from a yield of 32.77 cents during the 12-month period ending March 2001.

SCHEDULED CAPACITY AND TRAFFIC

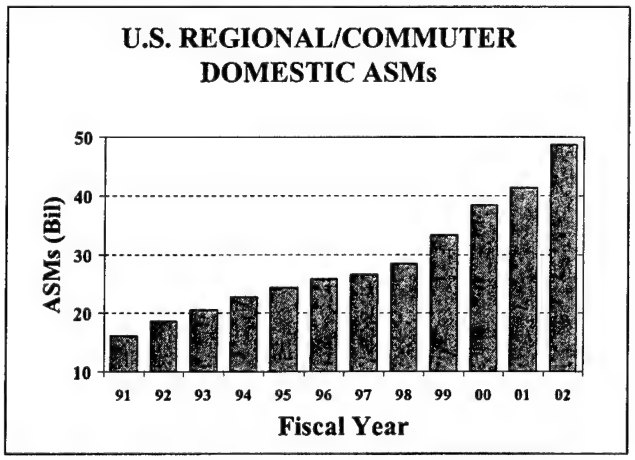
During 2002, system available seat miles (ASMs) increased 16.6 percent to 50.2 billion, while RPMs rose 21.9 percent to 30.8 billion. This resulted in the system load factor increasing by 2.6 points to 61.3 percent. System regional/commuter passengers were 90.7 million in 2002, 8.5 percent over 2001 levels. Regional/commuter carriers accounted for 14.5 percent of total commercial enplanements in 2002, up from 12.2 percent in 2001, and 8.6 percent in 1991.

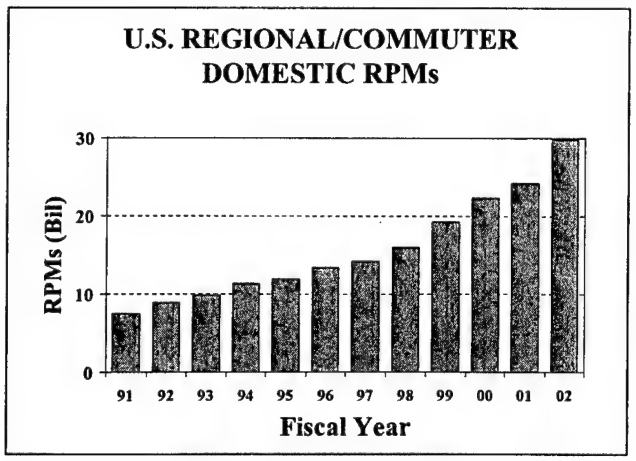
Domestic Capacity and Traffic

The domestic regional/commuter database includes activity for all U.S. regional/commuters operating in the 48 contiguous states, Alaska, Hawaii, Puerto Rico, and the U.S. Virgin Islands. It also includes transborder traffic into Canada.

Available Seat Miles

In 2002, domestic scheduled U.S. regional/commuter ASMs were up 17.7 percent. This compares to an increase of 7.9 percent during 2001. During the period 1991-2001, domestic ASMs have increased at an average annual rate of 9.9 percent.





The large increase in domestic ASMs during 2002 occurred for several reasons. First, the level of ASMs posted for 2001 was lower than expected due to a weakened economy, the 3-month long Comair strike, and the shutdown of the aviation system for 3 days after the terrorist attacks. The events that dampened capacity in 2001, combined with the transfer of routes from network carriers to regionals during 2002, resulted in ASMs posting an above average increase for the year.

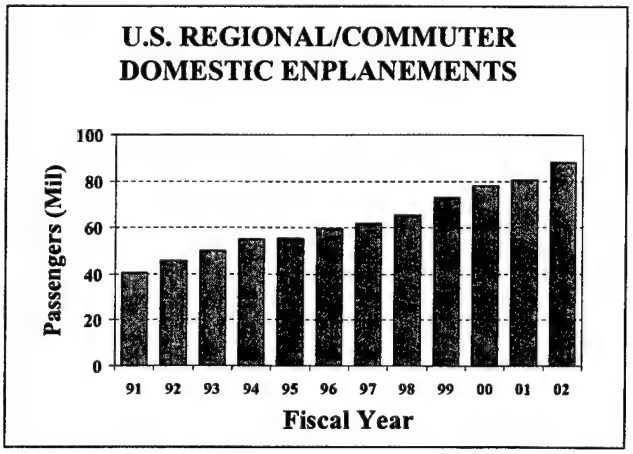
Revenue Passenger Miles

Domestic RPMs increased 23.1 percent in 2002, totaling just over 29.8 billion. This gain is much higher than the average annual growth rate of 12.4 percent for the 10-year period from FY 1991-2001. The large growth in RPMs results from the same factors as ASM growth, but is also partially due to the number of larger (50-70 seat) regional jet aircraft that are entering the fleet and the longer-haul routes that are being served by these aircraft.

The higher growth in RPMs relative to ASMs (23.1 percent vs. 17.7 percent) increased the domestic load factor 2.7 points to 61.3 percent in 2002. Over the 10-year period from 1991-2001, the regional/commuter carriers' load factor increased at an average annual rate of 1.2 percentage points per year, going from 46.7 percent in 1991 to 58.6 percent in 2001.

Passenger Enplanements

From 1991-2001, domestic enplanements increased at an average annual rate of 7.1 percent. Domestic enplanements totaled almost 88 million in 2002, up 9.4 percent over 2001. Regional/commuter carriers accounted for 15.3 percent of total domestic enplanements in 2002.



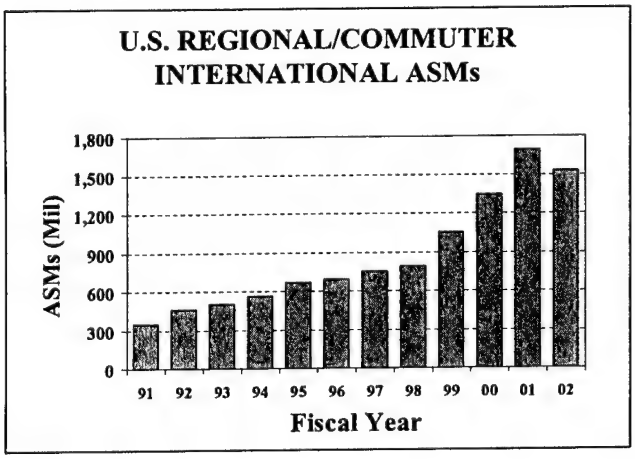
The slower growth in passengers relative to RPMs in 2002 (9.4 versus 23.1 percent) is due largely to the fact that the average passenger trip length increased 37.6 miles. This, in part, reflects the longer stage length of the routes being transferred from the larger code-sharing partners.

International Capacity and Traffic

The international regional/commuter database includes activity between the United States or its territories, and the Caribbean and Mexico.

Available Seat Miles

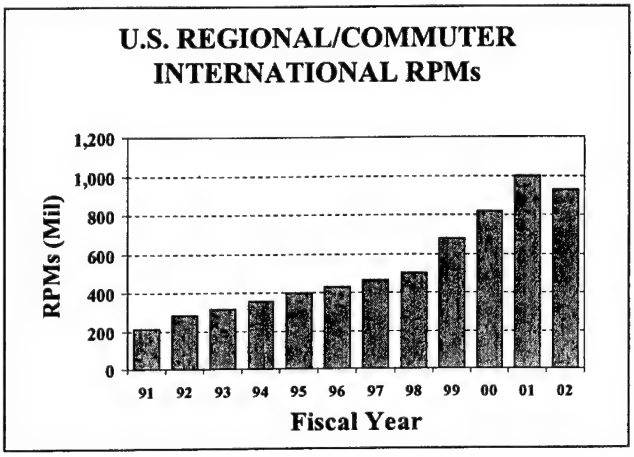
Regional/commuter international capacity accounts for only 3.0 percent of the total capacity flown by these carriers in 2002. For the year, scheduled international ASMs were down 9.5 percent. The drop during 2002 resulted in part from capacity cutbacks by American Eagle and Executive in the Caribbean. The cuts were due, in part, to scope clauses that limit the amount of flying that can be flown on the American code. In November 2002, American Eagle announced the sale of Executive Airlines. As a result of the sale, Official Airline Guide (OAG) schedules indicate that capacity in this region will return to 2001 levels in 2003. In 2001, American Eagle and Executive accounted for 60 percent of the ASMs flown internationally.



Revenue Passenger Miles

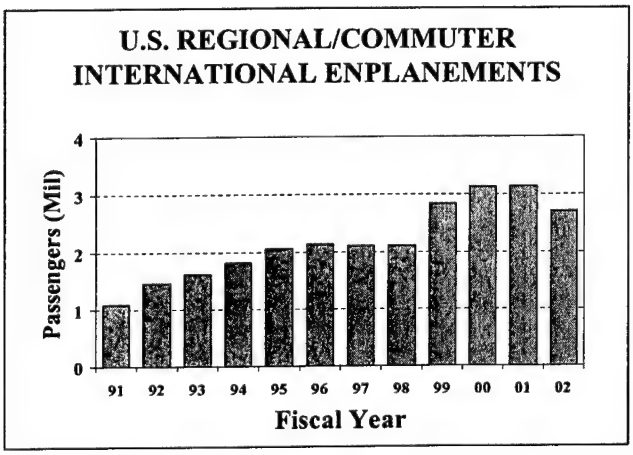
International RPMs for 2002 were down 6.9 percent to 932.3 million. This compares to an average annual growth rate from 1991 to 2001 of 16.7 percent. During the same period the load factor increased 1.7 points to 60.8 percent.

Actual data for the 1st half of 2002 indicates that 30 percent of the international RPMs flown by regionals/commuters are to Mexico with the remaining 70 percent flown to the Caribbean. Year-over-year percentage change for the same 6-month period shows that RPMs flown to Mexico were down 14.5 percent, while RPMs flown to the Caribbean were down 9.8 percent.



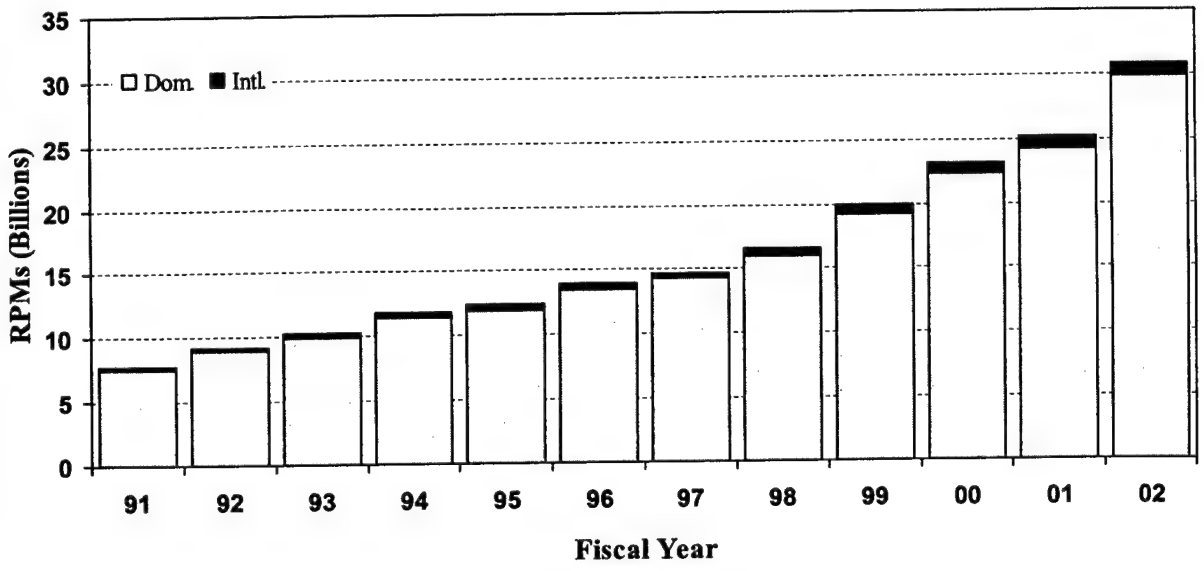
Passenger Enplanements

International enplanements totaled 2.7 million in 2002, down 13.7 percent from the previous year. The average annual growth rate in international regional/commuter passengers for the period 1991-2001 is 10.9 percent.

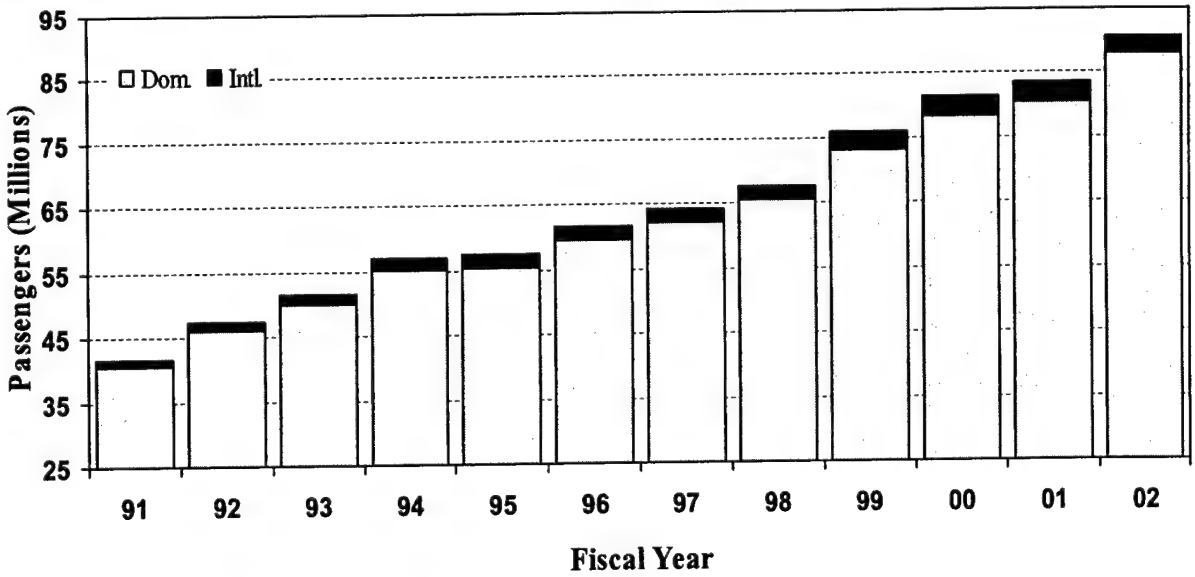


U.S. REGIONALS/COMMUTERS TRAFFIC TRENDS

Scheduled Revenue Passenger Miles



Scheduled Passenger Enplanements



THE EVOLUTION OF A "NEW REGIONAL" INDUSTRY

The fundamental character of the regional/commuter industry has changed significantly since the mid-1980s. These changes include the relative size and sophistication of airline operations, the carriers involved (especially the dominant industry operators), the aircraft fleet mix, and the industry's relationship with the large commercial air carriers in the national air transportation system.

Three distinct, but interrelated, trends have provided the basis for the changing character and composition of the industry since the mid-1980s. They are (1) industry consolidation/integration; (2) industry concentration; and (3) the advent of the regional/commuter "jet age."

CONSOLIDATION AND INTEGRATION

The number of regional/commuter airlines has declined by over two-thirds since 1981, from 250 to only 79 carriers in 2002, 7 less carriers than there were in 2001. The large decline in the number of carriers is the result of several factors. First, the dramatic growth in the number of code-sharing agreements with the major air carriers (see Table IV-1 for a current listing of code-sharing agreements) has made it difficult for carriers without such agreements to effectively compete. Secondly, the air carrier acquisitions of or purchases of equity interest in their regional/commuter code-sharing partners have led to a reduction in the number of independent operators. Finally, it is believed that the expense required for some regional/commuter carriers to comply with the "one level of safety" commuter rule pushed some of the regional/commuter carriers out of business.

CONCENTRATION

As the regional carriers go through the phase of consolidation, the size of the dominant industry carriers continues to increase. In 1981, the top 5 regional/commuter carriers accounted for only 20 percent of the passengers flown. By 1991, this percentage increased to 30 percent. In 2002, the top 5 carriers were responsible for flying over 46 percent of the passengers.

Today a large number of regionals are owned, totally or in part, by their larger code-sharing partners, and still others are owned by other regionals. In 2002, 10 regionals were owned totally or in part by 8 of the larger commercial air carriers. Three others were owned by three other regionals. However, in 2002 there were three significant spin-offs of regional subsidiaries by their major owner—Pinnacle (Northwest), Executive (American), and Express Jet (Continental).

A better picture of the present composition of the regional/commuter airline industry is presented in Table IV-3. This table, which lists the top 20 corporate structures and their percentage share of 2002 industry enplanements, more accurately reflects the level of industry consolidation and integration with the larger air carriers. In 2002, the top 5 corporate groups accounted for 57.9 percent of industry enplanements, the top 10 for 88.3 percent, and the top 20 for 98.1 percent.

TABLE IV-1

AIR CARRIER/COMMUTER AIRLINES CODE-SHARING AGREEMENTS AS OF DECEMBER 2002

Air Carrier Program Name	Designated Commuter Carrier	Primary Hubs Served
1. Alaska Airlines	Horizon	Boise, Portland, Seattle, Spokane
	Era Aviation	Anchorage
	Peninsula Airways	Anchorage
2. AirTran	Air Wisconsin	Atlanta
3. Aloha Airlines	Aloha Island Air	Honolulu
4. America West Express	Chautauqua Airlines	Columbus
	Big Sky	Denver
	Mesa	Los Angeles, Phoenix
5. American Eagle	American Eagle	Boston, Miami
		New York – JFK/LGA
		Dallas/Ft. Worth
		Chicago – ORD
	Executive Airlines	San Juan
6. American Connection	Chautauqua Airlines	St. Louis
	Corporate Airlines	St. Louis
	Trans States	St. Louis
7. American Trans Air	Chicago Express	Chicago – MDW
8. Continental	CommutAir	Boston, La Guardia
	Gulfstream Int'l. Airlines	Ft. Lauderdale, Miami, Tampa
	ExpressJet	Cleveland, Houston, Newark
	Horizon	Portland, Seattle
	Mesaba	Detroit, Memphis, Minn/St. Paul
	Pinnacle Airlines	Detroit, Memphis, Minn/St. Paul

AIR CARRIER/COMMUTER AIRLINES
CODE-SHARING AGREEMENTS AS OF DECEMBER 2002 (Continued)

Air Carrier Program Name	Designated Commuter Carrier	Primary Hubs Served
9. Delta Connection	Atlantic Coast Airlines	Boston, Cincinnati
	Atlantic Southeast Airlines	Atlanta, Dallas/Ft. Worth
	Comair	Cincinnati, Orlando
	SkyWest Airlines	Salt Lake City Dallas/Fort Worth
	Chautauqua Airlines	Orlando
	American Eagle	Los Angeles
10. Frontier Airlines	Mesa-Operating as Frontier JetExpress	Denver
	Great Lakes	Denver
11. Midwest Express	Air Midwest	Kansas City
	American Eagle	Dallas/Fort Worth, Los Angeles
	Astral/Skyway Airlines	Milwaukee
12. Northwest Airlink	Mesaba	Detroit Minneapolis/St. Paul
	Pinnacle Airlines	Detroit Memphis Minneapolis/St. Paul
13. United Express	Air Wisconsin	Chicago – ORD, Denver
	Atlantic Coast	Washington, D.C. – IAD Chicago – ORD
	Great Lakes	Chicago – ORD, Denver
	SkyWest	Los Angeles, Portland, Seattle, San Francisco

AIR CARRIER/COMMUTER AIRLINES
CODE-SHARING AGREEMENTS AS OF DECEMBER 2002 (Continued)

Air Carrier Program Name	Designated Commuter Carrier	Primary Hubs Served
14. US Airways Express	Air Midwest	Kansas City
	Allegheny Airlines	Baltimore Pittsburgh Philadelphia
	Chautauqua Airlines	La Guardia Philadelphia Pittsburgh Boston
	Colgan Air, Inc.	Pittsburgh Boston New York – LGA
	Mesa Air Group	Pittsburgh Charlotte Philadelphia
	MidAtlantic Airways	Pittsburgh
	Piedmont Airlines	Washington - DCA Charlotte Philadelphia Tampa
	PSA Airlines	Charlotte Philadelphia Pittsburgh
	Shuttle America	Boston Philadelphia
	Trans States	Pittsburgh

TABLE IV-2

TOP 50
REGIONAL/COMMUTER AIRLINES
RANKED BY TOTAL PASSENGER ENPLANEMENTS

FISCAL YEAR 2002

Carrier	Enplanements	Carrier	Enplanements
1. American Eagle	11,719,009	26. Aloha Island Air	330,318
2. Continental Express	8,834,910	27. Shuttle America	303,035
3. Comair	8,181,111	28. CCAir	237,534
4. Atlantic Southeast	7,659,216	29. Eagle Canyon Airlines	222,672
5. Sky West Aviation	7,311,672	30. Corporate Express Air	186,771
6. Atlantic Coast Airlines	6,537,951	31. Peninsula Airways	153,533
7. Mesaba	5,311,296	32. Seaborne Aviation	131,529
8. Horizon	4,654,282	33. Big Sky	131,049
9. Mesa	4,194,392	34. Commutair	123,763
10. Air Wisconsin	4,171,191	35. Hageland Aviation	101,841
11. Piedmont Airlines	3,243,101	36. Freedom Air	85,640
12. Chautauqua	3,073,943	37. Frontier Flying Service	66,539
13. Pinnacle Airlines	2,420,522	38. Pacific Island Aviation	64,242
14. Allegheny Airlines	2,132,931	39. Grant Aviation	64,229
15. Trans States Airlines	1,847,914	40. Ozark Airlines	58,988
16. Executive Airlines	1,467,967	41. Bering Air	53,988
17. PSA Airlines	1,129,988	42. Kenmore Air Harbor	52,944
18. Chicago Express	815,636	43. Chalks International	51,827
19. Air Midwest	785,385	44. Samoa Air	49,029
20. Gulfstream International	623,209	45. Air Nevada	41,475
21. Great Lakes Aviation	534,086	46. Warblow's Air Venture	38,768
22. Astral Aviation	529,337	47. Promech	36,026
23. Cape Air	522,574	48. Cape Smythe	34,997
24. Colgan Air	408,385	49. Wings of Alaska	32,514
25. ERA Aviation	388,475	50. Vieques Air Link	20,917

Source: DOT Form 298-C and Form 41, and FAA Estimates

TABLE IV-3
TOP 20 CORPORATE STRUCTURES - FY 2002

Carrier/ Carrier Group	Percent of Industry Enplanements	Carrier/ Carrier Group	Percent of Industry Enplanements
1. Delta	17.3	11. Chautauqua	3.4
2. American Eagle	14.4	12. Trans States	2.0
3. ExpressJet	9.7	13. ATA Connection	0.9
4. Northwest Airlink	8.5	14. Gulfstream International	0.7
5. Skywest	8.0	15. Cape Air	0.6
6. Atlantic Coast	7.2	16. Great Lakes	0.6
7. US Airways Express	7.1	17. Colgan Air	0.5
8. Mesaba	5.8	18. ERA	0.4
9. Mesa Air Group	5.7	19. Aloha Air Group	0.4
10. Air Wisconsin	4.6	20. Shuttle America	0.3

Source: DOT Form 298-C and Form 41, and FAA Estimates

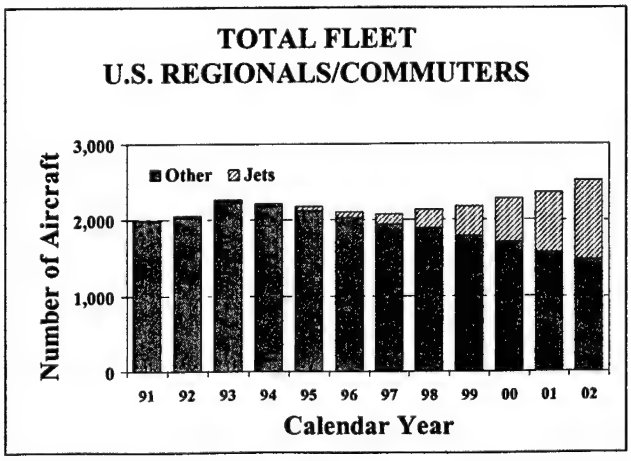
THE REGIONAL/COMMUTER JET AGE

The introduction of the regional jet into the dynamics of the demand for air transportation services has significantly expanded the role and market presence of the regional/commuter industry. The phenomenal customer acceptance of the regional jet, coupled with the success operating carriers have experienced in markets where the aircraft is deployed, positions its operators to move beyond the current boundaries of traditional regional/commuter markets. The regional jets' range and speed has opened up new opportunities, allowing regional/ commuter carriers to serve longer-haul markets and to by-pass congested hub airports by providing point-to-point service.

In last year's forecast document, the FAA analyzed 11 years (1991-2001) of schedules from the OAG to assess the growing impact of regional jets on the industry. This analysis has been updated to include data for 2002.

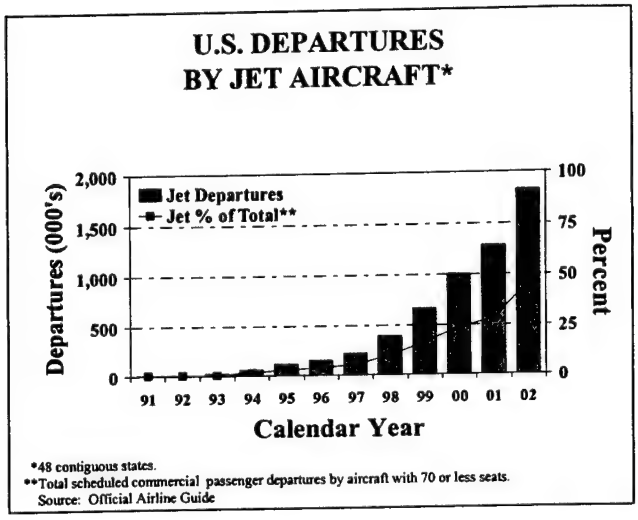
Fleet Composition

In 1991, three regional/commuter air carriers operated a total of 20 jets, accounting for one percent of the total fleet and 4.0 percent of seats offered for sale. It was not until 1997 that the introduction of the regional jets started to accelerate, increasing by over 100 aircraft annually (194 aircraft in 2002) over the next 5 years.

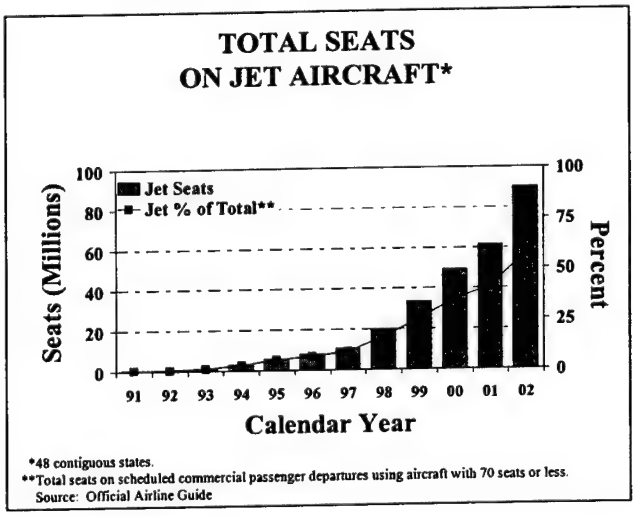


Activity and Operational Measures

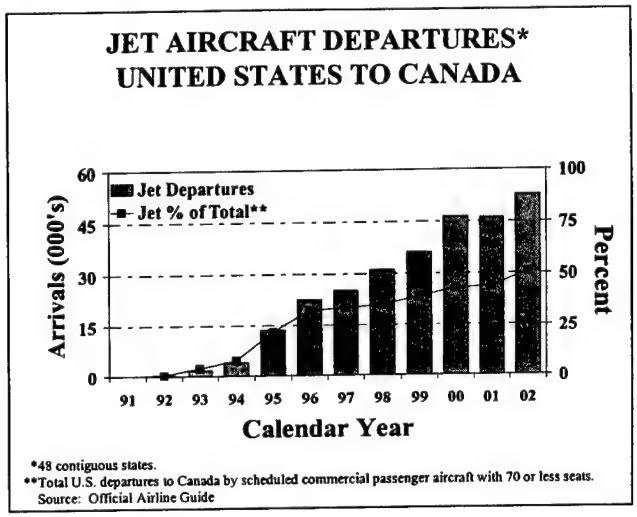
The number of scheduled regional/commuter jet departures in the 48 contiguous states has grown from just under 9,100 in 1991 to over 1.8 million in 2002. In 2002, jet departures by regionals/commuters accounted for 45.8 percent of the industry departures, up from just 0.2 percent in 1991. In 2002 alone, jet departures increased 42.2 percent, from 1.3 million in 2001 to 1.8 million in 2002.



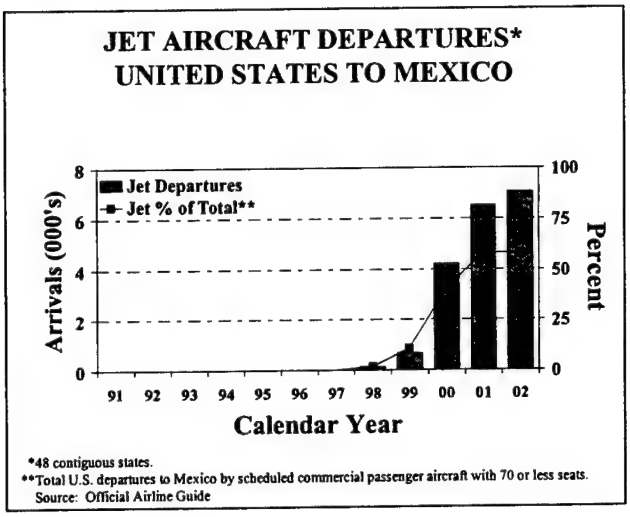
While jet aircraft accounted for 45.8 percent of regional/commuter departures, they accounted for 57.2 percent of regional/commuter seats in 2002. Seat capacity provided by commuter jet aircraft increased 47.0 percent from 2002, for an additional 29.0 million seats.



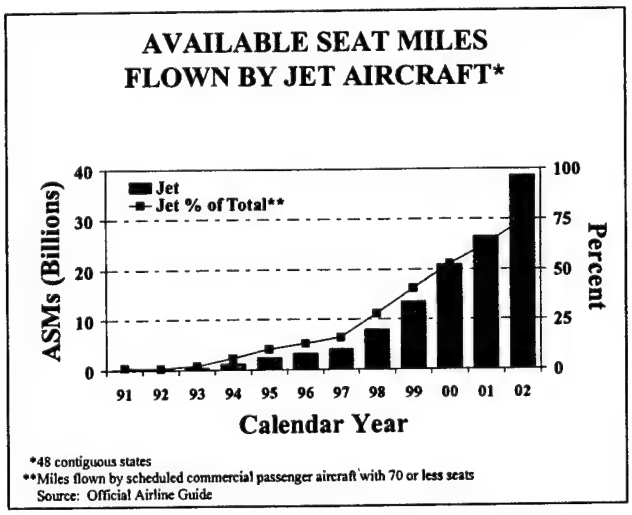
Jet aircraft have also penetrated the transborder markets. In 1992, less than 1.0 percent of all regional/commuter flights between the United States and Canada were flown with jet aircraft. In 2002, jets flew almost 51 percent of regional/commuter flights between the two countries. These 52,800 flights provided 2.6 million seats, over 60 percent of regional/commuter seat capacity between the United States and Canada. Since 2001, jet flights and seats in this market increased 14.2 and 16.6 percent, respectively.



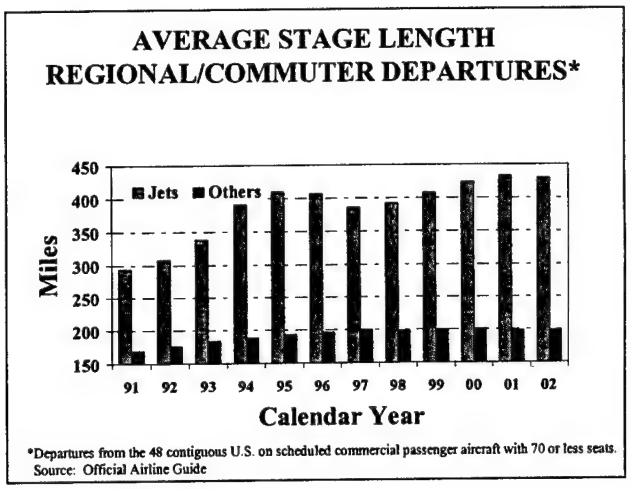
The newest international market for regional/commuter aircraft departing from the United States is Mexico. In 2002, only 5 years after the introduction of jet service, regional/commuter carriers flew over 7,000 jet flights between Mexico and the United States, 57.7 percent of all regional/commuter flights in these markets. In addition, during 2002, jet seat capacity increased by almost 37,000 seats. By year end, 70.5 percent of regional/commuter seat capacity between the United States and Mexico was flown by jet aircraft.



With their higher cruise speed and longer range capabilities, the ASMs flown by jet aircraft are also increasing rapidly, from just 0.9 percent of total industry ASMs flown in 1991 to 74.3 percent in 2002. Between year-end 2001 and 2002, the ASMs flown by jet aircraft increased 46.0 percent, compared to an increase of 26.8 percent between 2000 and 2001.



The growth in ASMs flown is indicative of the fact that regional jets are being operated on routes significantly longer, on average, than traditional regional/commuter routes. Since 1994, following the introduction of the 50-seat regional jet, the average stage length flown by regional jets has generally exceeded 400 miles. By comparison, the average stage length for all other regional/commuter aircraft departing from the U.S. has remained at around 200 miles.

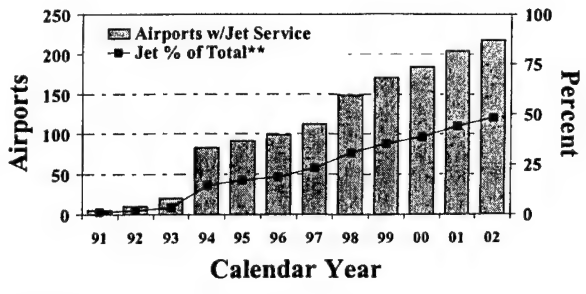


Markets/Routes Served

Regional jets provide the flying public with significantly more travel options to choose from in making their travel plans. With the addition of the Bombardier, Embraer, and Fairchild-Dornier regional jets, regional jets are serving more small- and medium-sized hubs. Consequently, the number of airports and city-pairs benefiting from jet service are at an all-time high.

The number of U.S. airports receiving regional/commuter jet service increased from a total of only six in 1991 to 218 in 2002. During 2002, the number of U.S. airports receiving regional jet service increased by 14 airports. In 1991, only 1.1 percent of the airports served by regional/commuter aircraft had jet service. In 2002, 48.2 percent of all airports served by regionals/commuters received jet service. At present, only two states--Hawaii and Alaska--do not have regional jet service.

U.S. AIRPORTS SERVED BY JET AIRCRAFT*

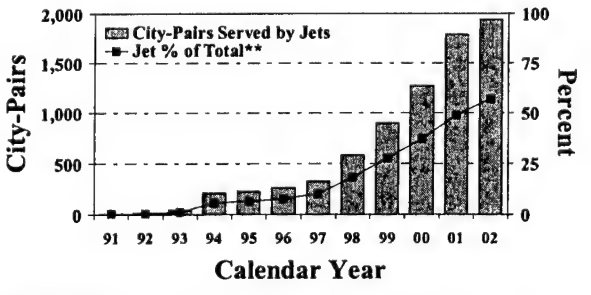


*48 contiguous states.
**Total airports with scheduled commercial passenger service by aircraft with 70 or less seats.
Source: Official Airline Guide

The number of airports in Canada and Mexico served by regional jets did not change from 2001. In 2002, regional/commuter jet aircraft flew to nine Canadian airports from the United States, up from just two airports in 1992. In Mexico, there are 17 airports with regional/commuter service; up from only one airport in 1998.

The number of city-pairs originating from airports in the U.S. has also increased significantly. Regional/commuter city-pairs with jet service grew from 10 in 1991 to 1,943 in 2002. In 2002 alone, an additional 157 city-pairs received regional/commuter jet service, raising the percentage of regional/commuter city-pairs with jet service to over 56.7 percent.

CITY-PAIRS SERVED BY JET AIRCRAFT



*48 contiguous states.
**Total city-pairs with scheduled commercial passenger service by aircraft with 70 seats or less.
Source: Official Airline Guide

Of the 1,943 city-pairs served by regional jets in 2002, 73 were flown in international transborder service. Between the United States and Canada, jets served 55 of 97 regional/commuter city-pairs. Between the U.S. and Mexico, 18 of the 27 regional/commuter city-pairs received jet service.

Top 10 Regional/Commuter Airports

The top ranked airport in 2002 with respect to regional jet departures was Cincinnati/Northern Kentucky International (CVG). Scheduled jet departures at CVG totaled 138,779 in 2002, 95.7 percent of all regional/commuter departures (jet and turboprop) and 66.6 percent of all commercial departures (air carrier and regional/commuter) at the airport.

Chicago O'Hare International (ORD), the top ranked regional jet airport in 2001 (as a result of the Comair strike), ranked second to CVG in 2002, with a total of 118,530 jet departures. Dallas/Fort Worth (70,530), Atlanta Hartsfield (70,060), and Cleveland-Hopkins (63,494) round out the list of the top five airports with scheduled jet service from regional/commuter carriers. Dallas/Fort Worth went from 37,643 scheduled regional jet departures in 2001 to 70,530 departures in 2002, moving up from its ranking of ninth in 2001.

Regional jet departures at the top 10 ranked regional/commuter airports accounted for 73.7 percent of total regional/commuter departures and 28.4 percent of total commercial departures at these 10 airports. In the 48 contiguous states, commuter jet departures rose from 32.0 to 45.8 percent of all regional/commuter departures, and from 11.6 percent to 19.0 percent of all commercial departures during 2002.

TABLE IV-4

TOP 10 AIRPORTS
RANKED BY COMMUTER JET DEPARTURES
CALENDAR YEAR 2002

	ID	Airport	Commuter* Jet Depart.	Commuter* Total Depart.	Commercial** Depart.	Regional Jet Departures as a % of Total: Commuter Depart.	Regional Jet Departures as a % of Total: Commercial Depart.
1.	CVG	Cincinnati/N.Kentucky Int'l.	138,779	144,955	208,468	95.7	66.6
2.	ORD	Chicago O'Hare Int'l.	118,530	128,000	442,280	92.6	26.8
3.	DFW	Dallas/Fort Worth Int'l.	70,530	128,614	364,126	54.8	19.4
4.	ATL	William B. Hartsfield Int'l.	70,060	109,999	421,630	63.7	16.6
5.	CLE	Cleveland-Hopkins Int'l.	63,494	69,632	109,663	91.2	57.9
6.	EWR	Newark Int'l.	48,549	55,386	183,994	87.7	26.4
7.	BOS	Boston Logan Int'l.	48,439	77,760	178,352	62.3	27.2
8.	IAH	Houston Intercontinental	48,199	67,300	211,132	71.6	22.8
9.	LGA	New York La Guardia	46,614	75,998	180,531	61.3	25.8
10.	IAD	Washington Dulles Int'l.	41,079	83,972	143,039	48.9	28.7
		Departures - Top 10	694,273	941,616	2,443,215	73.7	28.4
		Total Departures - 48 U.S.	1,827,652	3,993,883	9,637,171	45.8	19.0

* Scheduled Commercial Passenger Aircraft with seat size >=3 and <71.
**Scheduled Commercial Passenger Aircraft with seat size >= 3.
Source: Official Airline Guide published October 2002

Industry Impact

The past several years have witnessed the rapid development of routes utilizing regional jets, much to the increasing satisfaction of most of the travelling public. However, even with the high traffic growth being experienced by the industry, there is erosion of the number of city-pairs receiving non-stop regional/commuter service. The reduction of city-pairs is most apparent in the shorter-haul markets, as regional/commuter carriers move toward a fleet composed of greater numbers of jet aircraft.

In 1995, an initiative was started to bring all air carriers operating aircraft with a capacity between 10 and 30 seats under the same operating rules as those carriers with large aircraft. The initiative called for "one level of safety" and placed stringent safety standards on regional/commuter carriers. The additional costs required to meet the safety standards made smaller aircraft uneconomical to operate. In March of 1997, the initiative became law and is now known as the commuter rule. Since the end of 1994, the number of city-pairs served by regional/commuter aircraft has declined from a high of 3,795 to a low of 3,199 at the end of 1998. Most of the city-pairs dropped served shorter-haul markets.

At present, there are 3,427 city-pairs being flown in the 48 contiguous states, 231 less than flown in 2001. Since 420 of the 3,427 city-pairs are new, there was actually a decline of 652 city-pairs receiving non-stop regional/commuter

service. Of the 652 city-pairs that lost nonstop service, 74 had access to non-stop service by large air carriers. The remaining city-pairs lost non-stop regional/commuter service altogether.

Of the 420 new city-pairs receiving nonstop regional/commuter service in 2002, 120 previously had service at some point prior to 2001. Out of the remaining 300 pairs, 165 were served solely by air carriers during 2001, while the remaining 135 were new markets—meaning that they did not receive non-stop service from regional/commuters or large air carriers during 2001.

The OAG illustrates the impact of the changing mix of the regional/commuter aircraft fleet on shorter-haul routes. From 2000 through 2002 regional/commuter departures from the 48 contiguous states, saw an increase in the routes flown over 1,000 miles, and a decrease in the routes flown less than 300 miles.

In 2000, only 20 city-pairs measured distances greater than 1,000 miles. By 2001, this number had increased to 31, with another 23 pairs added in 2002. The longest distance flown was 1,325 miles between Oklahoma City and Newark. It is anticipated that as more of the larger regional jets and turboprops enter the fleet, stage lengths will continue to rise.

During the same period city-pairs measuring less than 300 miles declined. Shorter-haul routes accounted for 2,165 city-pairs in 2000; 2,092 in 2001; and 1,794 in 2002. Overall, this is a reduction of 371 short-haul city-pairs since the end of 2000, or an average annual decrease of 186 city-pairs losing non-stop regional/ commuter service. The results are more dramatic when analyzing the 11-year period between 1991 and 2002. The average annual decrease in city pairs during this time was 166, for an overall reduction of 1,272 short-haul city pairs, or a 41.5 percent decrease since 1991.

In 1994, one year prior to the "one level of safety" initiative, 3,795 city-pairs were flown. Eighty-two percent of these pairs measured distances of less than 300 miles. At the end of 1997, the year the commuter rule was enacted, shorter-haul city-pairs were only 77 percent of the city-pairs flown. By the end of 2002, only 52 percent of the city-pairs being flown by regional/commuters were less than 300 miles.

RISKS AND UNCERTAINTIES

The air carrier industry is currently undergoing major changes, perhaps unlike any other period during the history of commercial passenger service, including deregulation. Changes include the rising share of traffic flown by low-fare carriers and regional/commuters, and the filing for bankruptcy by US Airways and United Airlines. It remains to be seen what impacts these events will have on the industry.

As the regional/commuter industry moves forward, it is confronted with old issues as well as new. Maintaining cost structure, operating within the confines of scope clauses, and managing airspace and airport congestion continue to be concerns. Pushed to the forefront in 2002 was the effect of security requirements on users of regional/commuter air service.

The ability of regional carriers to maintain their cost structure is fundamental to their appeal to large air carriers. The goal of network carriers is to gain feed from the regionals while providing a seamless service to customers. Network carriers provide this seamless service through outsourcing and code-sharing. The cost environment that the regionals operate in further advances arrangements that are beneficial to both the regionals/commuters and the network carriers.

Scope clauses continue to limit the ability of regional airlines to optimally match the right-

sized aircraft to market demand. These clauses define routes and services that mainline airlines may subcontract to the regionals. Scope clauses can place limits on the size and number of aircraft operated by regional airlines, and/or the number of ASMs flown by the regional.

While the terrorist attacks of September 11th have temporarily sidelined the issue of congestion, it is expected to reappear as demand returns to pre-September 11th levels. As demand returns, some aviation professionals are concerned that the increasing number of regional jets operating in the U.S. will contribute to airport and airspace congestion. Unlike turboprop aircraft that operate most efficiently at altitudes one half that of the regional jets, regional jet aircraft operate most efficiently and economically in airspace shared with large jet aircraft. Consequently, the replacement of turboprop aircraft by regional jet aircraft increases congestion in airspace previously used only by large jet aircraft. It is believed that technology and scheduling improvements will help to fight off congestion.

Security has impacted all air travelers, since September 11th. Passengers flying in shorter-haul markets, though, are most likely to have altered their travel behavior. As consumer confidence in flying returned after the terrorist attacks, passengers endured long lines at airport security checkpoints. The increased time required to pass through checkpoints negatively impacted the number of passengers flying in short-haul markets. Short-haul passengers resorted to other methods of travel and/or conducting business as the perceived cost of air travel became greater than the benefit. Some of the alternatives for short-haul air travel are intercity rail, the automobile, and audio and video conferencing. As the Transportation Security Administration (TSA) standardizes security screening at airports throughout the U.S. it is believed that that the "hassle factor" will be reduced to levels more acceptable to the traveling public.

FORECAST METHODOLOGY

In normal times, regional/commuter demand is modeled using economic assumptions as inputs. However, the events of September 11th made econometric models unreliable, at least in the short-term. The forecasts for the 2003-2005 period are based on assumptions regarding capacity, with demand forecasts developed from assumptions regarding load factor, aircraft seat size, and average trip length.

The starting point for developing short-term regional/commuter capacity was the flight schedules published in the January 2003 Official Airline Guide (OAG). The scheduled departures, ASMs, seats, and miles flown for the first 3 quarters of 2003 (to June 2003) were compared against historical capacity for previous years and adjusted, where necessary, to reflect seasonal patterns or known changes not reflected in these schedules. The July-September quarter was estimated based on historical seasonality.

To prepare forecasts for RPMs and enplanements, discussions were held with individual carriers, trade associations, manufacturers, and industry analysts to gain expert insight into developing trends. As well, the Transportation Research Board (TRB) Regional/Commuter Subcommittee meets twice a year to discuss issues pertinent to the regional/commuter industry. Using this insight, assumptions for load factor and trip length were made on a quarterly basis in an attempt to capture the trends taking place in the industry. The quarterly assumptions for load factor were used to forecast industry RPMs. Lastly, industry RPMs combined with quarterly assumptions for passenger trip length provided the forecast for industry enplanements.

These preliminary estimates of supply and demand were compared with actual capacity and

traffic data from trade publications and carrier web sites and adjusted as necessary. Although the forecasts for 2003 contain numerous assumptions developed from expert opinion and analyst expertise, we believe the forecasts to be reasonable in terms of capturing the anticipated course of events.

For 2004 and 2005, projected deliveries of new regional jet aircraft and average ASM utilization rates were used to estimate system ASMs. Assumptions for load factor and trip length were used to derive RPMs and enplanements.

For the remainder of the forecast period (2006 through 2014) industry growth rates are based on econometric models and traditional assumptions regarding load factor and average passenger trip length.

FORECAST ASSUMPTIONS

In previous years, the regional/commuter database combined carriers reporting traffic using Form 298C with a select group of Form 41 carriers operating both large aircraft over 60 seats and smaller regional/commuter aircraft. As a result, traffic reported by the Form 41 carriers operating both large and small equipment were included in the regional/ commuter databases as well as in the large air carrier databases. For clarity, the level of duplicated traffic (enplanements and RPMs) would be presented in the technical notes of the FAA Aviation Forecasts.

The new definition for the regional/commuter industry resulted from revisions to DOT reporting requirements and the delivery of new regional commuter aircraft larger than 60 seats. The revised FAA definition will place individual air carriers into one of two categories: regional/commuter *or* large air carriers, with the regionals defined as those carriers flying most of their ASMs using aircraft having 70 seats or less. The division of carriers into specific categories eliminates the duplication of traffic, capacity, and financial statistics between the regional/commuter and the large air carrier databases.

Stemming from the change in reporting requirements, the regional/commuter forecasts will no longer distinguish those carriers reporting on Form 298C from those reporting on Form 41. Instead, separate capacity and traffic forecasts will be prepared based on type of travel--domestic or international. Domestic forecasts include travel between the United States, its territories and Canada. International forecasts are based on travel between the United States and its territories and Mexico and the Caribbean. Previously, regional/commuter traffic was presented on a system basis only.

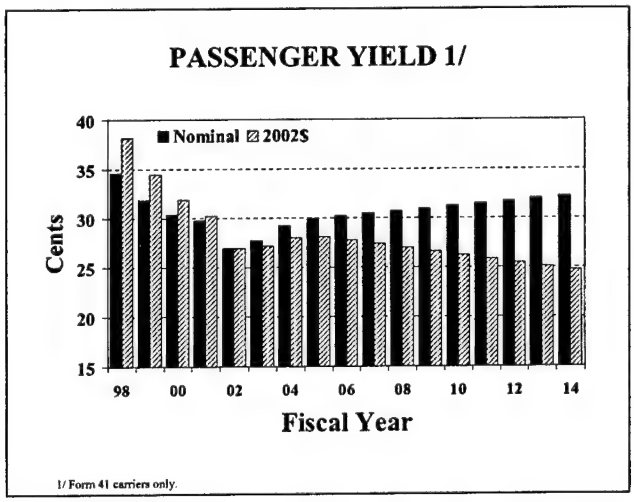
The development of the regional/commuter international database required several sources including: DOT Form's 298C (Table 11A), 41, and T100 as well as the Official Airline Guide. Since 298C carriers only report RPMs and enplanements on Table 11A, the Official Airline Guide was used to backfill history for ASMs, miles flown, seats, and departures for these carriers. Also, of the five Form 41 carriers that offer international service, three do not report domestic traffic separately from international on Form 41. For these carriers, DOT T100 data was used for international traffic counts. This international traffic was subtracted from the system traffic reported by each of the three carriers to arrive at "pure" domestic traffic.

The baseline assumptions for passenger yield, average aircraft seat size, passenger trip length, and load factor are presented in tabular form in Chapter X, Table 23.

PASSENGER YIELD

The nominal passenger yield for the reporting Form 41 regional/commuter air carriers was 26.93 cents in 2002, down 11.0 percent from 2001. Even with these declines, the Form 41 regional/commuter carriers' yield is still more than double that of the larger air carriers (11.87 cents in 2002).

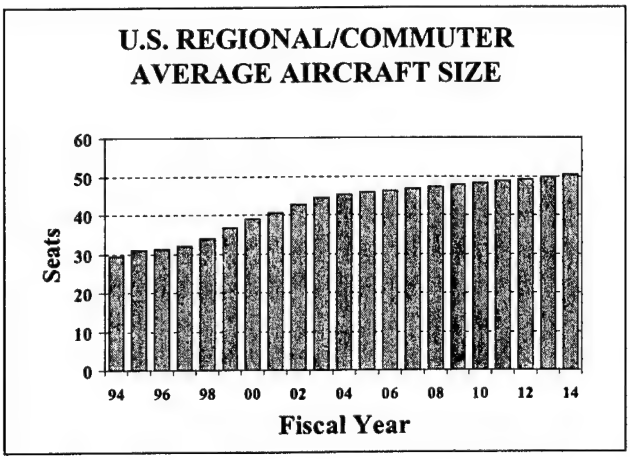
Several factors are responsible for the decrease in nominal yield. The economy in 2001 suffered a 3-quarter recession. Many corporations acted quickly by either reducing travel budgets and/or seeking less expensive ways to conduct business. As a result, purchases of higher-fare tickets dropped, cutting into revenues made by carriers that were not operating on a contract-flying basis. Revenues were also reduced as the industry lured customers back to flying with reduced fares for leisure travel. Finally, the increased utilization of regional jets operating at higher load factors and longer passenger trip lengths contributed to declining yields in 2002.



The nominal yield is expected to increase at an average annual rate of 1.5 percent, from 26.93 cents in 2002 to 32.22 cents in 2014. The real yield is projected to rise during the first 3 years of the forecast period and decline slowly thereafter, reaching 24.73 cents in 2014. This is an average annual decline of 0.7 percent over the 12-year forecast period.

AVERAGE AIRCRAFT SIZE

The most significant change in fleet composition will result from the integration of large numbers of regional jet aircraft into the fleet, most of which occurs in the 50 to 70 seat category. These aircraft have already increased public acceptance of regional airline service, and offer the greatest potential for replacement service on selected jet routes.



The regional/commuter aircraft fleet is expected to continue to grow rapidly during the first several years of the forecast period. Average seats per aircraft (calculated by dividing available seat miles by miles flown) is expected to increase by 1.7 seats annually over the 12-year forecast period, from 42.8 seats in 2002 to 50.4 seats in 2014. Most of the growth in seat size is expected to come from those carriers operating the larger turboprop and regional jets.

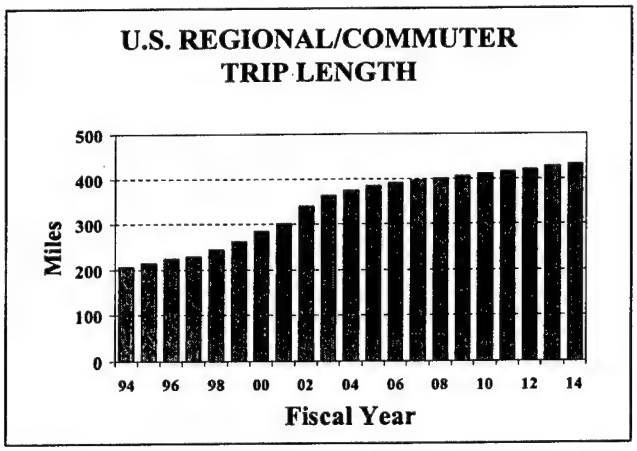
PASSENGER TRIP LENGTH

The impact of the regional jet is reflected in the growth in the average passenger trip length. The introduction of regional jets in large numbers beginning in 1997 coincides with the significantly higher growth in the average passenger trip length. Between 1990 and 1996 the average passenger trip length increased

43 miles, or 7.2 miles per year. From 1996 to 2002, the average regional/commuter passenger trip length increased by 114.1 miles, for an average of 19.0 miles per year.

In 2002 the average passenger trip length increased by 37.1 miles. Over the next 3 years, the average trip length is expected to increase 23.7, 11.8, and 10.2 miles, then slow to 5 miles annually over the remainder of the forecast period. Over the 12-year forecast period the average trip length is projected to increase from 339.2 miles in 2002 to 431.6 miles in 2014, for an average annual increase of 7.7 miles.

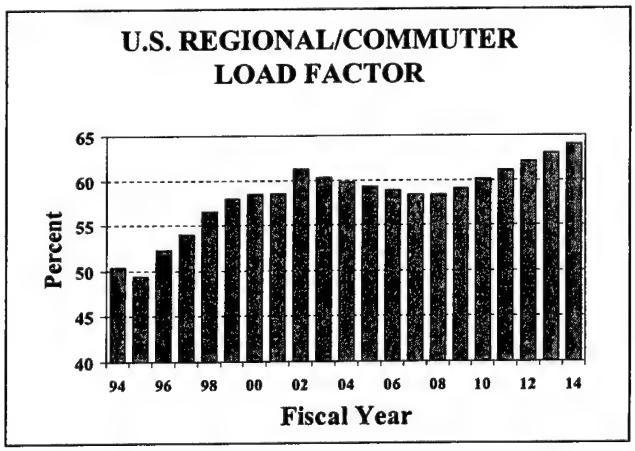
The domestic trip length is forecast to increase from 339.1 miles in 2002 to 432.9 miles in 2014. The international trip length is expected to increase from 344.2 miles in 2002 to 389.5 miles in 2014.



PASSENGER LOAD FACTOR

The average industry load factor is projected to decline for the first 5 years of the forecast period -- down one percentage point to 60.3 percent in 2003, and then down 0.5 percentage points annually from 2004 through 2007 for a load factor of 58.4 percent in 2007. The decline in load factors during this period reflects the large increases in capacity due to 1,108 regional jet aircraft entering the fleet (an average of 221 aircraft delivered per year). In 2008 the load factor holds steady at 2007 levels, and then increases by 0.7 percentage points in 2009. For the remainder of the period (2010-2014), the load factor rises 1.0 percentage points annually for a load factor of 64 percent in 2014. The rising load factors during the latter years of the forecast period are due to regional jet aircraft deliveries tapering from 154 aircraft in 2008 down to 90 aircraft in 2014. It is also assumed the regional/commuter industry will continue to emphasize frequency of service and this should keep regional/commuter load factors from reaching the level of the major airlines.

The load factor for domestic travel is forecast to increase from 61.3 percent in 2002 to 64.0 percent in 2014. The international load factor is forecast to grow from 60.8 percent in 2002 to 65.0 percent in 2014.



REGIONALS/COMMUTERS FORECASTS

The increasing number of aircraft, especially regional jets with ranges beyond 1,000 miles, is creating new opportunities for growth in nontraditional regional/commuter markets. However, the primary role of the regional industry will remain that of feeding traffic to the major and national carriers, even as they expand into new markets with longer route segments.

For the large air carriers, use of their regional partners is an effective way to maintain a market presence when forced to reduce excess capacity in selected markets. Regional partners can backfill with regional jets and provide service in comparable comfort and speed at a lower cost. The events of September 11th heightened the need for the larger commercial air carriers to reduce overall costs and capacity and resulted in the transfer of large numbers of markets and routes to their regional partners. This transfer of routes is expected to be one of the major drivers of growth during the early years of the forecast.

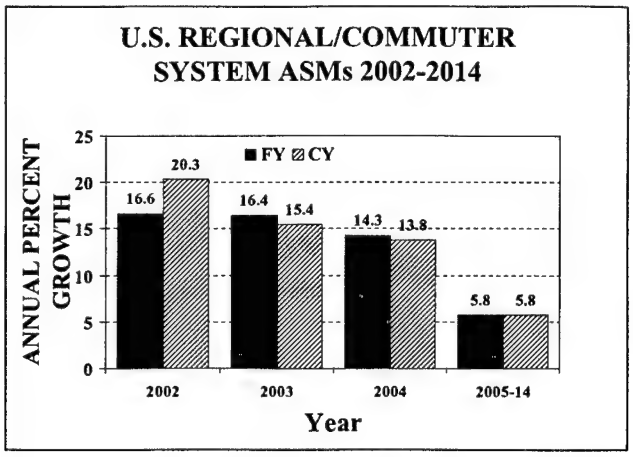
While the transfer of selected routes is expected to accelerate during the early years of the forecast period, this phenomenon should diminish considerably during the mid to latter years of the forecast period. Consequently, the rate of growth in traffic will be lower than that experienced in the past.

Regional/commuter forecasts of enplanements, ASMs, RPMs, fleet, and hours flown are presented in tabular form in Chapter X, Tables 24 to 26.

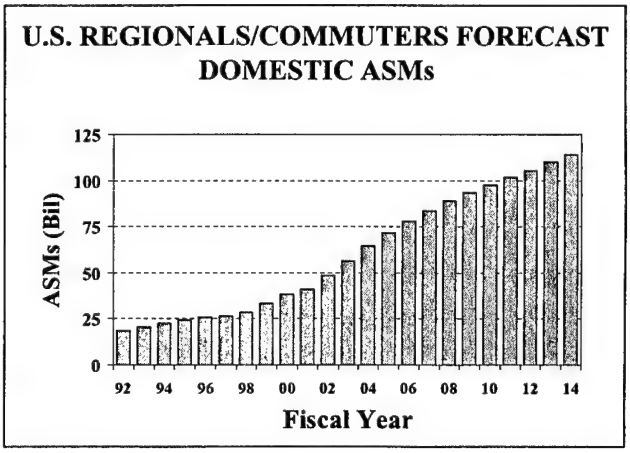
AVAILABLE SEAT MILES

In 2003, the year-over-year percentage change in ASMs is expected to be 20.3 percent for the 1st quarter, 17.1 percent for the 2nd quarter, 13.7 percent for 3rd quarter, and 15.1 percent for the 4th quarter. Again, these higher rates primarily reflect routes being transferred by the network carriers along with the increase in 50-70 seat regional aircraft being added to the fleet. Total ASMs for the year are 58.4 billion, a 16.4 percent increase over 2002.

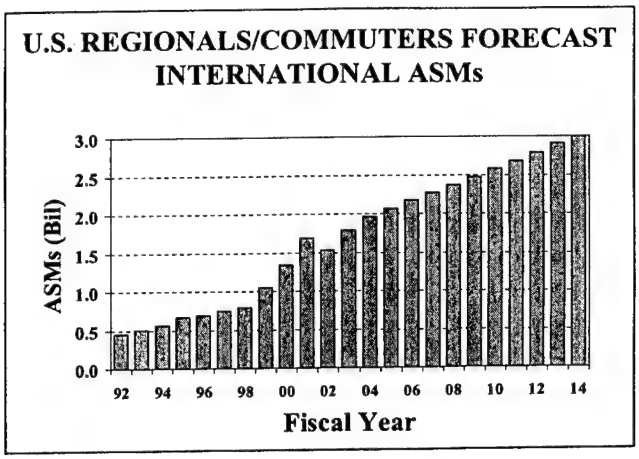
System ASMs are forecast to increase 14.3 percent in 2004 and 10.8 percent in 2005, reaching a total of 74.0 billion in the latter year. From 2006 through 2014 regional ASMs will increase at an average rate of 5.3 percent. Over the 12-year forecast period, ASMs are forecast to increase at an average annual rate of 7.3 percent for a total of 117.3 billion in 2014.



Domestic ASMs are forecast to increase 16.4 percent (to 56.6 billion) in 2003, 14.4 percent in 2004 (to 64.8 billion), and 10.9 percent in 2005 (to 71.9 billion). During the 12-year forecast period, ASMs are expected to increase at an annual rate of 7.4 percent, totaling 114.3 billion in 2014.

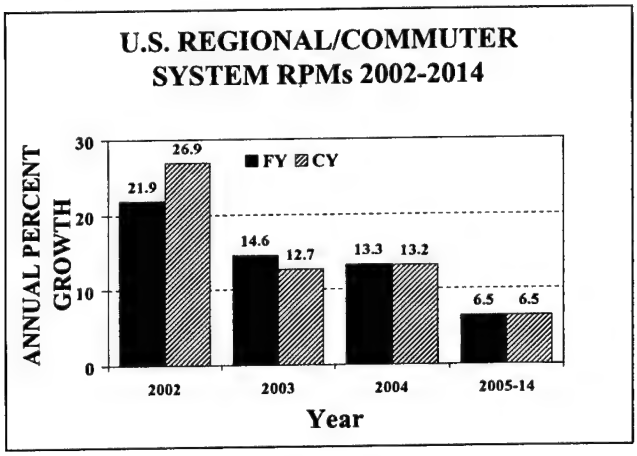


International ASMs are projected to increase to 1.8 billion (up 17.1 percent) in 2003, and to 2.0 billion (up 9.7 percent) in 2004. During the final 10 years of the forecast period, these carriers' ASMs are expected to grow at an average annual rate of 4.4 percent and total 3.0 billion in 2014.

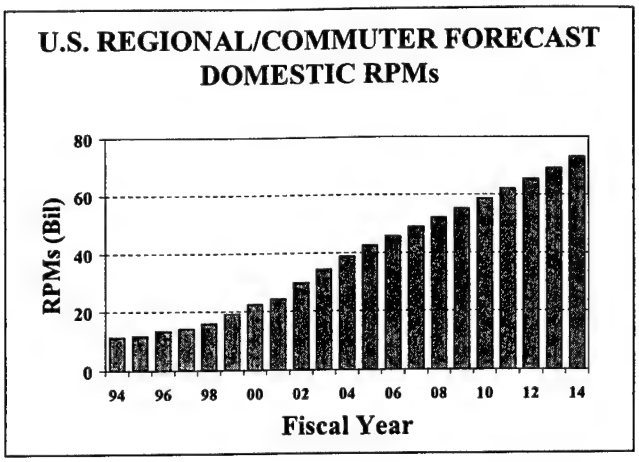


REVENUE PASSENGER MILES

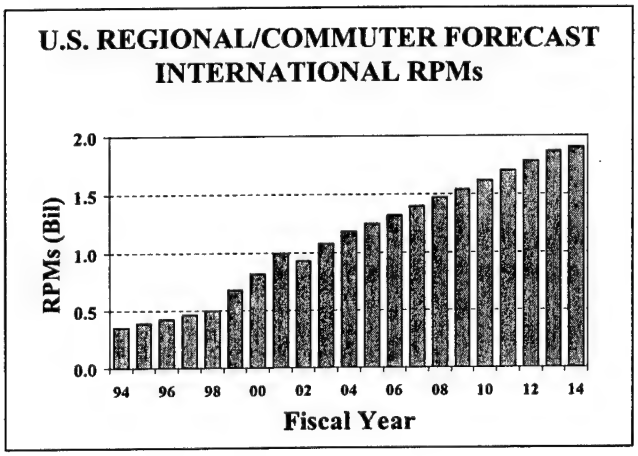
Regional/commuter RPMs are expected to increase 14.6 percent (to 35.3 billion) in 2003, 13.3 percent in 2004 (to 40.0 billion), and 9.9 percent in 2005 (to 43.9 billion). The high growth rates reflect the longer stage lengths being flown by the large number of regional jets continuing to enter the fleet. From 2006 through 2014 regional RPMs will increase at an average annual rate of 6.2 percent. Over the 12-year forecast period, the average annual rate of growth in RPMs is 7.8 percent for a total of 75.1 billion in 2014.



Domestic passenger miles are forecast to increase at rates of 14.5, 13.4, and 10.0 percent over the first 3 years of the forecast period, then slow to 6.2 percent annually over the remainder of the forecast period. During the 12-year forecast period, RPMs are expected to increase at an annual rate of 7.7 percent, totaling 75.1 billion in 2014.



International passenger miles are projected to increase to 1.1 billion (up 15.4 percent) in 2003, and then increase to 1.2 billion (up 9.7 percent) in 2004. During the final 10 years of the forecast period, international RPMs are expected to grow at an average annual rate of 5.2 percent and total 2.0 billion in 2014.

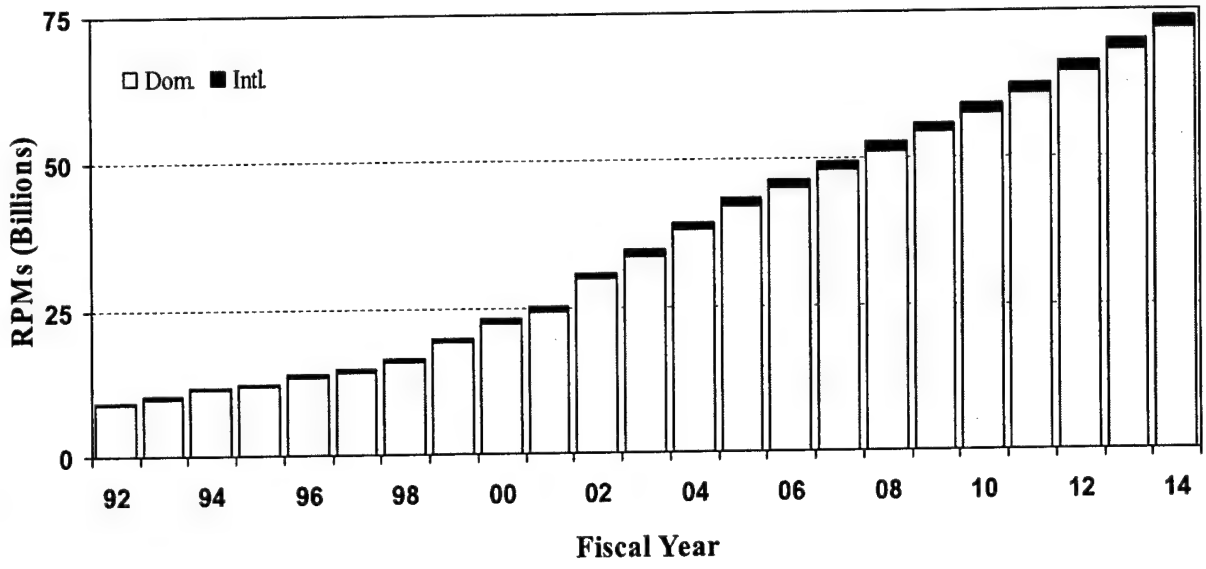


REVENUE PASSENGER ENPLANEMENTS

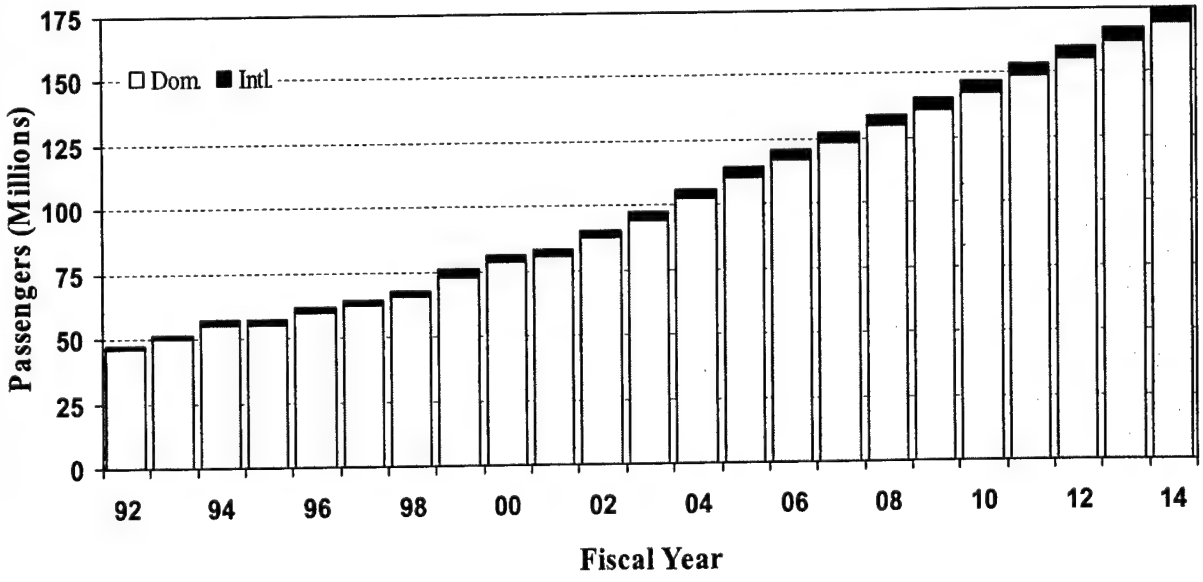
Regional/commuter passenger enplanements are projected to increase by 7.1 percent in 2003 (to 97.1 million), 9.7 percent in 2004 (to 106.6 million), and 7.0 percent in 2005 (to

U.S. REGIONALS/COMMUTERS TRAFFIC FORECASTS

Scheduled Revenue Passenger Miles



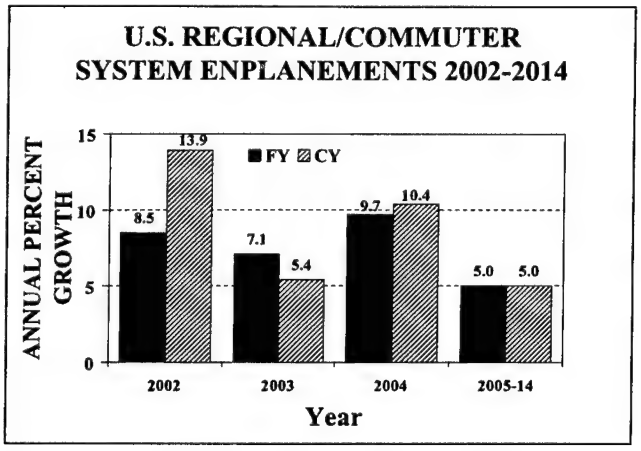
Scheduled Passenger Enplanements



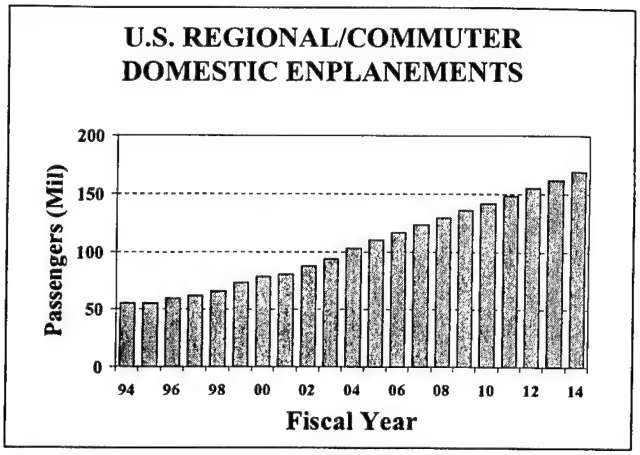
114.0 million). The strong rates of growth during the 3 year period reflects the transfer of additional routes from the larger air carriers and the addition of regional jet aircraft to their fleet.

Between 2006 and 2014 enplanements will grow at an average rate of 4.8 percent annually for a total of 174.1 million enplanements in 2014. Over the entire 12-year forecast period, system enplanements are forecast to grow 5.6 percent annually. In 2014, regional/ commuter carriers are expected to account for 17.5 percent of all commercial air carrier enplanements.

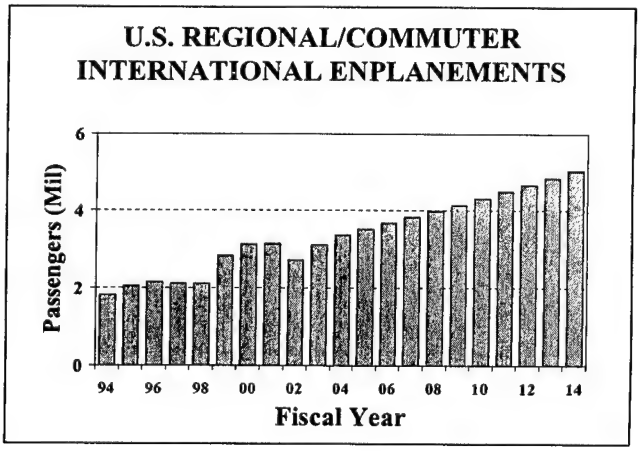
Enplanements are expected to increase at a slower rate than RPMs over the forecast period. This is due to the fact that the average passenger trip increases an average of 7.7 miles over the 12-year forecast period.



Domestic enplanements are projected to increase 6.9 percent in 2003, 9.8 percent in 2004, and 7.0 percent in 2005, totaling 110.5 million passengers at the end of the 3-year period. Between 2006 and 2014 domestic enplanements will increase at an average annual rate of 4.8 percent. Over the entire 12-year forecast period, enplanements are forecast to increase at an average of 5.6 percent annually, totaling 169.0 million in 2014 -- 18.6 percent of all domestic enplanements.



International enplanements are projected to increase 14.4 percent in 2003 (to 3.1 million), and by 8.5 percent in 2004 (to 3.4 million). Over the entire forecast period, international enplanements are projected to increase at an average annual rate of 5.3 percent, totaling 5.0 million in 2014.

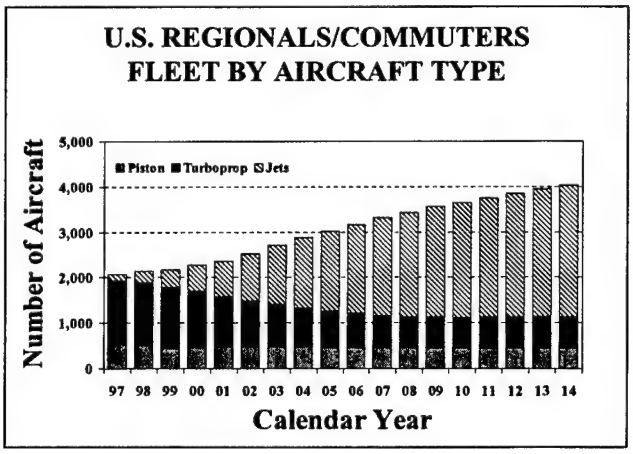


REGIONALS/COMMUTERS PASSENGER FLEET

The regional/commuter fleet, once composed primarily of piston and turboprop aircraft, is moving toward a fleet predominantly made up of regional jet aircraft. Before September 11th, regional/commuter carriers deployed regional jet aircraft for the purpose of entering new markets and for supplementing and/or replacing turboprop routes. Post September 11th, the regional/commuter carriers are deploying assets

on routes traditionally served by mainline carriers in response to the carriers transferring thin routes to their regional partners. As regional/commuter carriers began flying more long haul routes using jet aircraft, many of the shorter-haul routes traditionally flown by turboprop aircraft were discontinued.

Over the 12-year forecast period, the regional/commuter passenger fleet is projected to net an average annual increase of 126 aircraft, going from 2,521 aircraft in 2002 to 4,034 aircraft in 2014. During the same period, the overall fleet of turboprop aircraft will decrease by 324 aircraft. For the first 3 years of the forecast 3.5 regional jet aircraft will enter the fleet for every turboprop aircraft retired.



Most of the aircraft in the "less than 10 seats" category are operated by Alaskan regional carriers. Regional aircraft in this category once made up the bulk of the fleet--60.9 percent in 1980. In 2002, this category totaled 490 aircraft and accounted for only 19.4 percent of the total regional fleet. Between 2002 and 2014, the number of aircraft in this category is expected to drop to 455 aircraft and account for only 11.3 percent of the fleet. It is assumed that the decline in this category will occur almost entirely among regional airlines operating within the 48 contiguous states.

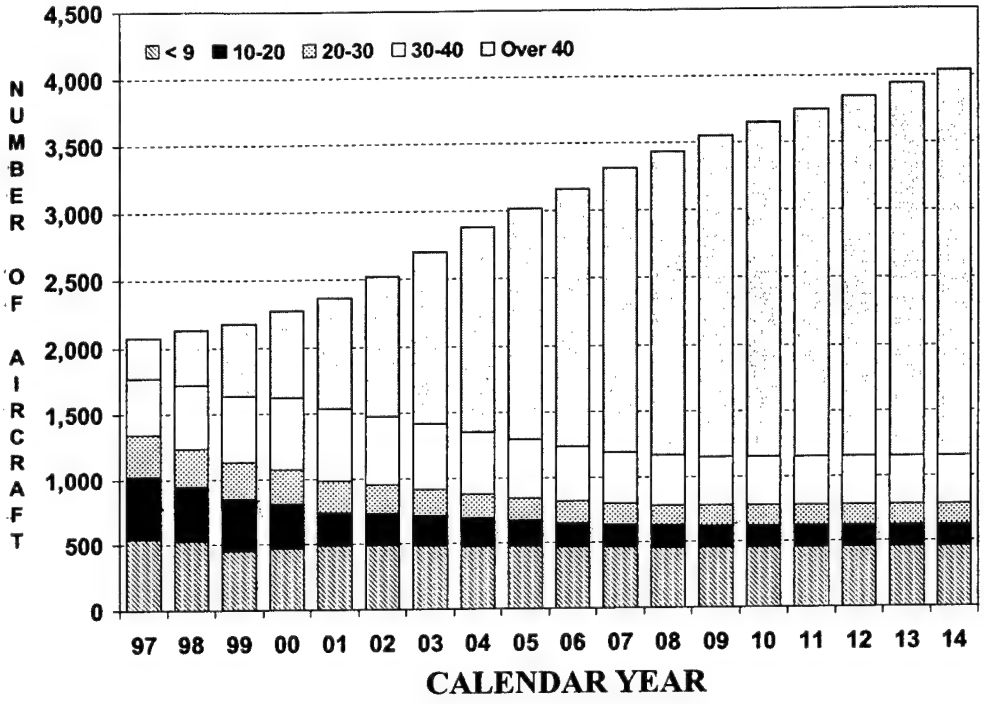
The turboprop aircraft in the 10-40 seat range totaled 871 in 2002 and was 34.5 percent of the fleet. By 2014, these aircraft are expected to be 13.9 percent of the fleet and total 562 aircraft. The average net decrease in the fleet is almost 26 aircraft per year. At present, many of the short-haul markets serviced by the turboprop aircraft have disappeared as a result of the processing time connected with ticketing and clearing through security checkpoints. It is anticipated that as demand returns, these routes will once again be economically viable for the regionals/commuters to operate on.

The fleet of turboprop aircraft in the over 40 seats category totaled 128 in 2002. Over the 12-year forecast period, this portion of the fleet is expected to have a net decrease of one aircraft. It is anticipated that some of the regional/commuter carriers will retire many of their ATR aircraft during the early years of the forecast. There are also expected to be deliveries of the Bombardier Q400 during this period as well. It is believed that scope clause limitations on regional jets will result in the larger turboprops remaining in the fleet. In 2002, turboprop aircraft in the over 40 seat category was 5.1 percent of the fleet. In 2014, these aircraft are forecast to be 3.1 percent.

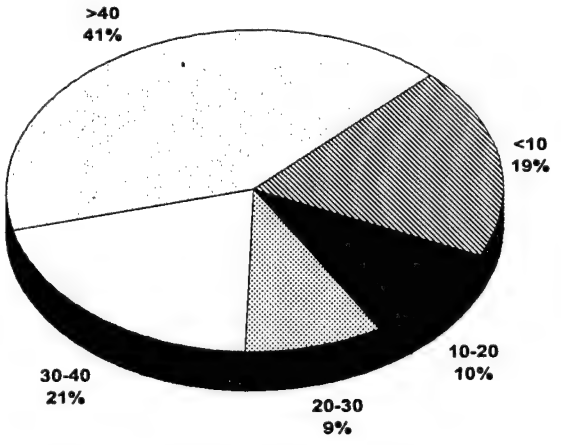
In the 30-40 seat regional jet category, there is expected to be a net increase of 16 aircraft over the forecast period. In 2002, this category of aircraft made up 4.7 percent of the fleet. By the end of the forecast period, regional jet aircraft in the 30-40 seat category are expected to be 3.3 percent.

The majority of the increase in the regional/commuter fleet will be from regional jet aircraft in the over 40 seats category. In 2002, there were 914 of these aircraft that made up 36.3 percent of the fleet. By 2014, there is expected to be an additional 1,842 aircraft entering the fleet for an average annual increase of 153.5 aircraft per year. Of the 1,842 aircraft that are forecast to enter the fleet over the 12-year period, just under 68 percent are expected to be delivered prior to 2008. By the end of the forecast period, regional jet aircraft will be 72 percent of the total regional/commuter fleet.

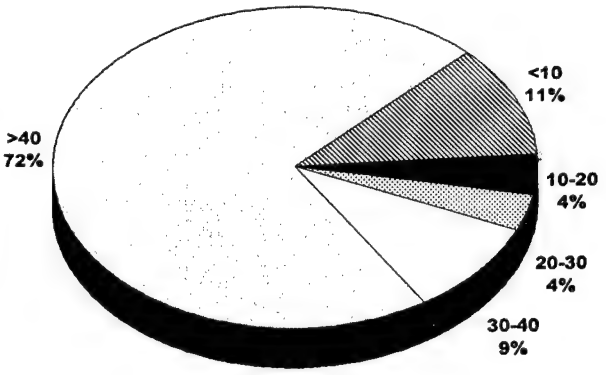
U.S. REGIONALS/COMMUTERS PASSENGER AIRCRAFT



PERCENT BY AIRCRAFT TYPE



2002

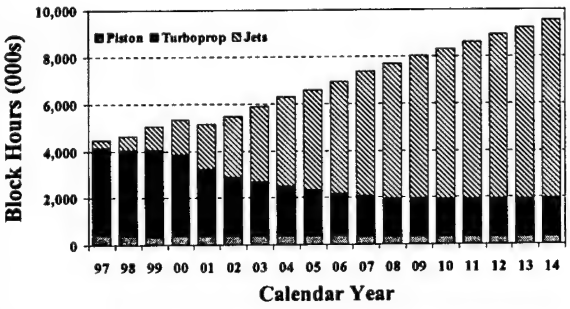


2014

BLOCK HOURS

Regional/commuter block hours for 2002 are estimated at 5.5 million, an increase of 6.3 percent over 2001. During the forecast period, hours are expected to increase to 5.9 million in 2003 (up 7.5 percent), to 6.3 million in 2004 (up 6.7 percent), and to 6.6 million (up 4.6 percent) in 2005. During the 12-year forecast period, flight hours are forecast to increase at an average annual rate of 4.7 percent, totaling 9.5 million hours in 2014.

U.S. REGIONALS/COMMUTERS BLOCK HOURS BY AIRCRAFT TYPE



Block hours flown by piston aircraft are forecast to decline from 0.4 million hours in 2002 to 0.35 million hours in 2014, for an average decrease of 1.1 percent annually. During 2002, piston aircraft flew 7.3 percent of the block hours for the industry. By 2014, piston aircraft are forecast to be 3.7 percent of the block hours flown by the regionals/commuters.

Block hours flown by turboprop aircraft totaled just under 2.5 million in 2002. Hours for this category of aircraft are expected to total 1.6 million in 2014, for an average annual decrease of 3.5 percent per year. The decline in hours during the early part of the forecast period is due to the retirement of turboprop aircraft. In 2002, turboprop aircraft accounted for 45.5 percent of all hours flown by the industry. By 2014, total hours flown by turboprop aircraft is forecast to drop to 17.0 percent.

Block hours for regional jet commuter aircraft totaled 2.6 million in 2002 and accounted for 47.2 percent of the hours flown. By 2014, block hours flown are forecast to total 7.6 million and to account for 80.0 percent of the hours flown. Block hours for regional jet aircraft are expected to increase at an average annual rate of 9.4 percent annually. The block hours grow at a faster rate during the early years of the forecast (2003-2008) as large numbers of regional jet aircraft are added to the fleet.

CHAPTER V

GENERAL AVIATION

CHAPTER V

GENERAL AVIATION

The term "general aviation" is used to describe a diverse range of aviation activities and includes all segments of the aviation industry except commercial air carriers (including commuter/ regional airlines) and military. Its activities include training of new pilots and pilots interested in additional ratings or certification, sightseeing, movement of large heavy loads by helicopter, flying for personal or business/corporate reasons, and emergency medical services. Its aircraft range from the one-seat single-engine piston aircraft to the long-range corporate jet, and also include gliders and amateur-built aircraft.

General aviation is an important part of both the aviation industry and our national economy. It provides on-the-spot efficient and direct aviation services to many medium and small sized communities that commercial aviation cannot or will not provide. In addition, the production and sale of general aviation aircraft, avionics, and other equipment, along with the provision of support services such as maintenance and repair, flight schools, fixed base operators, finance, and insurance, make the general aviation industry an important contributor to our nation's economy.

According to a study[1] published in the year 2002, general aviation made the following contributions to the U.S. economy in 2000:

- General aviation generated a direct impact of $13.7 billion in GDP and 178,000 jobs.
- General aviation generated a total impact (including indirect and induced impact) of $40.7 billion in GDP (0.4 percent of total GDP) and 511,000 jobs.

REVIEW OF 2001-2002

It has been 8 years since the passage of the General Aviation Revitalization Act of 1994 (GARA) and all indications are that the Act is accomplishing its purpose. The industry, hurt by rising product liability costs, had gone from producing a high of almost 18,000 aircraft in 1978 down to only 928 aircraft in 1994. The decline in production also resulted in the loss of 100,000 jobs in the industry. The success of GARA can be measured by resurgence in the demand of general aviation products and services over the past several years.

[1] *The National Economic Impact of Civil Aviation, July 2002, DRI-WEFA, A Global Insight Company*

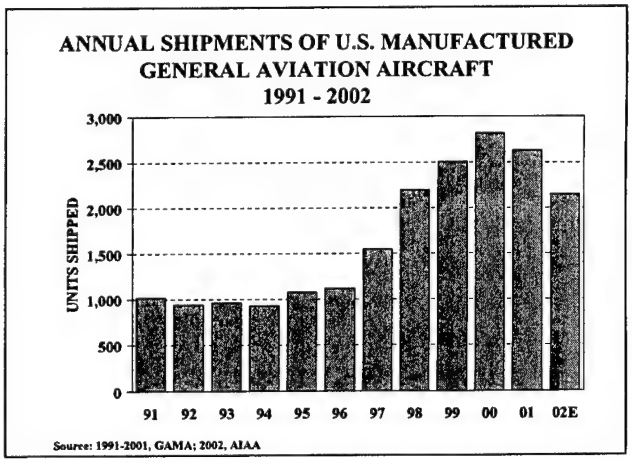
Calendar years 2001 and 2002, however, have proven to be difficult for general aviation. The price of aviation fuels and the general economic situation in the country have combined to adversely affect the demand for the general aviation products and services. The affects of the events of September 11th continue to impact the industry.

However, promise in the future is evidenced by the general aviation industry's development and production of new general aviation products and services. New and improved models are being introduced. Much of the improved demand for general aviation products is for aircraft at the higher priced end of the general aviation fleet--turbine powered aircraft--and is likely due, in part, to the rapid growth experienced by fractional ownership companies. Dollars spent on research and development are advancing avionics and computer technology. These advances are not only expected to improve general aviation safety, but are intended to make it easier to learn how to fly. Of course, without pilots to fly the planes there would be no industry. To stimulate growth in the pilot population, the industry is promoting flying with "learn to fly" programs. The industry is also developing programs to assist teachers in bringing aviation into the classroom with the hope of encouraging students to pursue careers in aviation.

What follows is a review of the industry's performance during 2001 and 2002. This period began with indicators moving in a negative direction, owing in large part to the 2001 U.S. economic recession. The lingering effects of the events of September 11th have only made the situation worse for GA. However, the General Aviation performance is not uniformly negative; some measures of GA activity still show increases. The hope is that segments which are experiencing positive results will create a foundation on which the entire general aviation industry can plan and build for the foreseeable future.

AIRCRAFT SHIPMENTS AND BILLINGS

According to statistics released by the General Aviation Manufacturers Association (GAMA), shipments of general aviation aircraft declined for a second consecutive year in 2002. In the first 3 quarters of 2002, general aviation shipments by U.S. manufacturers totaled 1,551 units, a decrease of 16.9 percent over the same period in 2001. Shipments declined for all three aircraft categories: pistons, from 1,221 to 1,031 (down 15.6 percent), turboprops, from 220 to 118 (down 46.4 percent): and jets, from 426 to 402 (down 5.6 percent).

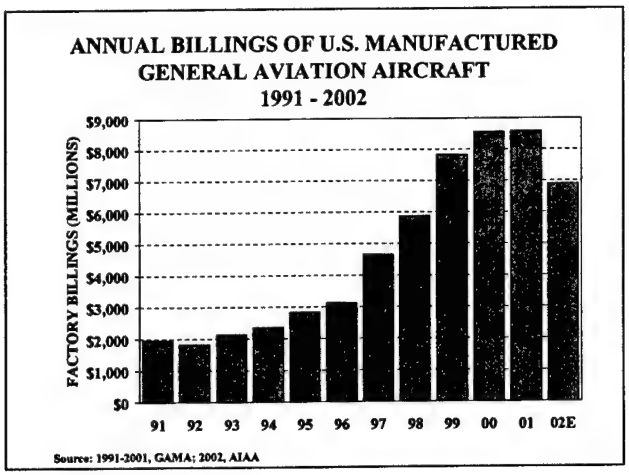


Billings for U.S. manufactured general aviation aircraft totaled $6.4 billion for the first 9 months of 2002, a decline of 25.2 percent from the corresponding 2001 figure.

In its year-end review and forecast[2], the Aerospace Industries Association of America (AIAA) estimates that the general aviation aircraft shipments will total 2,153 in 2002, a decline of 17.7 percent from 2001 shipments. In addition, AIAA estimates that the value of these aircraft will total $6.9 billion, a decline of 13.8 percent from 2001. If this prediction holds

[2] 2002 Year-End Review and 2003 Forecast, December 2002, Aerospace Industries Association of America

this will mark the first decline in billings since 1990.



A number of new product offerings could stimulate the market in future years. Among these is the advent of light sport aircraft.

PILOT POPULATION

At the end of 2002, the total pilot population is estimated at 661,358, an increase of almost 4,000 over 2001. Of the four major groupings[3]—student, private, commercial, and airline transport—only the student group experienced a significant decrease in 2002 according to figures from the FAA Civil Aviation Registry. These four pilot groupings accounted for 95.5 percent of all pilots in 2002. The three strictly general aviation groupings (Student, Private, Commercial) totaled accounted for 73.2 percent of all pilots.

The estimated number of active student pilots for 2002 is 85,991 down 8.9 percent from the estimated figure of 94,420 for 2001--the fourth consecutive decline based on re-estimated registry data.[4] Industry initiatives are still underway to increase the number of student pilots since they are seen as the future of general aviation. The industry's efforts to sustain and increase the market for its products and services will, in large part, depend on how successful its programs are in attracting new pilots. An increase in student pilots may not only be generated by those seeking private pilot certificates for personal enjoyment, but also for those seeking careers in aviation.

The number of private pilots totaled 260,845 (down 0.4 percent) in 2002 while the number of commercial pilots totaled 137,636 down very slightly form 2001. The number of airline transport pilots (147,104) was up by only 15 pilots in 2002, due, in part, to large schedule reductions in the aftermath of September 11th. However, the pilot category as a whole has posted increased numbers for 46 consecutive years.

The number of helicopter pilots (those holding helicopter certificates only) declined by 1.6 percent to 7,600 in 2002. The number of glider pilots increased from 8,473 in 2001 to 9,200 in 2002 (up 8.6 percent) while the number of recreational pilots increased from 318 in 2001 to 330 in 2002 (up 3.8 percent).

The number of instrument-rated pilots (321,000) remained basically constant in 2002. Instrument-rated pilots are currently 56.8 percent of total active pilots (excluding student and recreational pilots), down from 57.0 percent in 2001.

ACTIVITY AT FAA AIR TRAFFIC FACILITIES

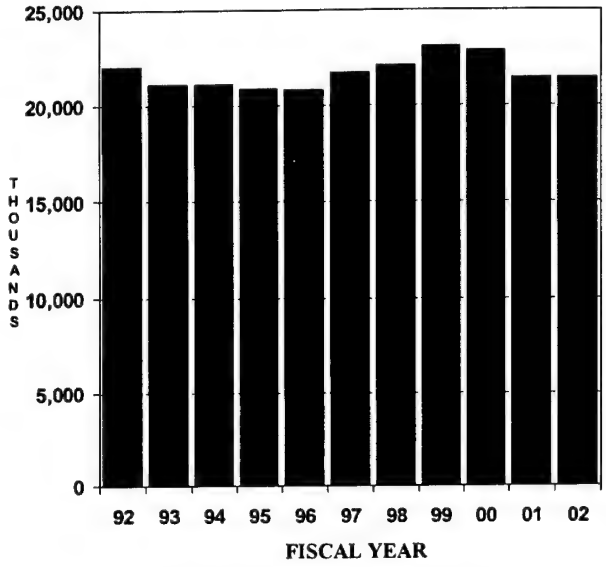
General aviation activity at combined FAA and contract towered airports declined by 0.1 percent

[3] In March 2001, the Registry changed the definition for Glider Only Pilots, adding approximately 13,000 to this category.

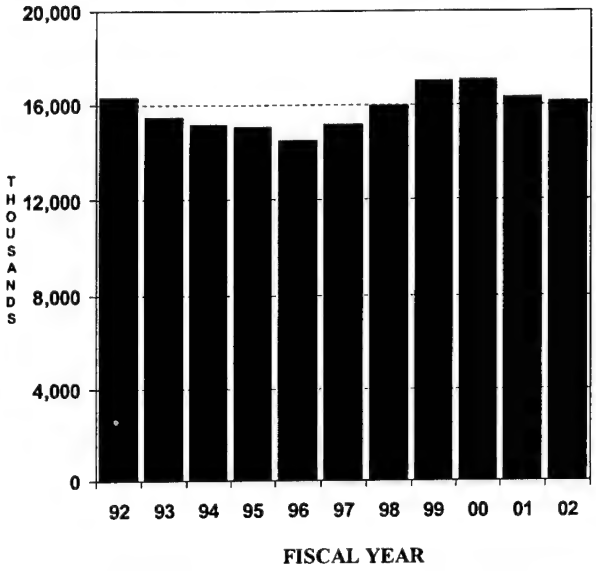
[4] Student Pilot numbers for the years 1999-2001 were discussed and approved by the Light General Aviation Panel at the 12th FAA/TRB International Workshop on Future Aviation Activities (September 2002).

GENERAL AVIATION ACTIVITY

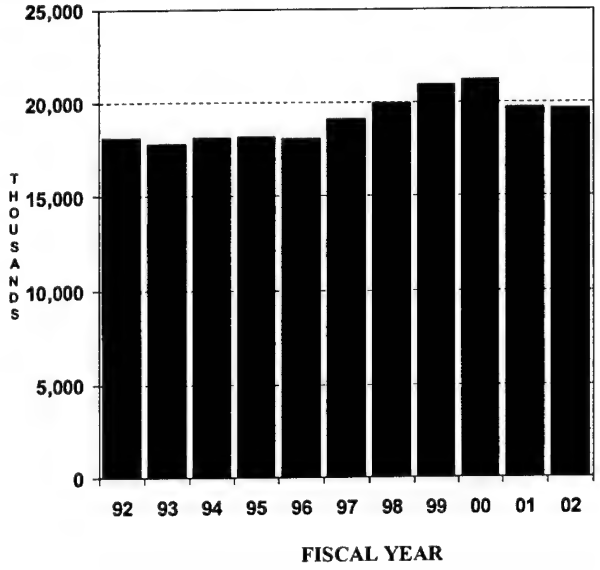
ITINERANT AIRCRAFT OPERATIONS (FAA AND CONTRACT TOWERS)



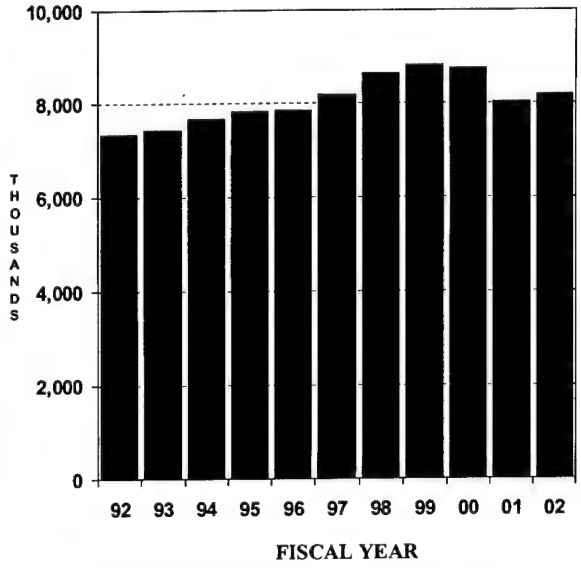
LOCAL AIRCRAFT OPERATIONS (FAA AND CONTRACT TOWERS)



INSTRUMENT OPERATIONS (FAA AND CONTRACT TOWERS)



IFR AIRCRAFT HANDLED AT FAA AIR ROUTE TRAFFIC CONTROL CENTERS



in FY 2002, following a decline of 5.7 percent in FY 2001. This slight decline was fairly evenly distributed between itinerant and local operations. However, general aviation operations at FAA towers declined 2.9 percent, while operations at contract towers increased 5.2 percent.

In FY 2002, the top 10 general aviation airports, as ranked by operations, accounted for 9.3 percent of general aviation activity at the 482 combined FAA/contract towers, and 5.4 percent of total aircraft activity at towered airports. Of the top 10 airports, three are in California, two are in Florida, and Texas, Arizona, Colorado, Oklahoma and North Dakota each have one. Four of the top 10 airports experienced a decline in operations from FY 2001 to FY 2002.

Operations at the 10 fastest growing general aviation airports, as ranked by the percentage increase over FY 2001, grew from a combined total of 367,432 general aviation operations in 2001 to 512,337 in 2002, an increase of 39.4 percent. The three airports with the largest percentage increase from 2001 to 2002 were Tyler Pounds Field in Texas, (up 52.8 percent), Lewisburg/Greenbrier in West Virginia (up 44.2 percent), and Greenville/Mid Delta in Mississippi (up 39.0 percent).

TABLE V-1

FASTEST GROWING GENERAL AVIATION AIRPORTS RANKED BY % CHANGE IN OPERATIONS: FY 2001-2002

Fac. Id.	City/Airport	2002	2001	% Ch. 01-02
TYR	Tyler Pounds Field	140,682	92,070	52.8
LWB	Lewisburg/Greenbrier	29,187	20,234	44.2
GLH	Greenville/Mid Delta	16,267	11,707	39.0
HUF	Terre Haute/Hulman	79,011	57,176	38.2
IAD	Washington Dulles	79,451	57,692	37.7
ERI	Erie International	37,333	28,147	32.6
DBQ	Dubuque Regional	47,732	36,154	32.0
MAF	Midland International	25,851	19,833	30.3
ADQ	Kodiak	5,263	4,054	29.8
LEB	Lebanon Municipal	51,560	40,365	27.7

Only one of the fastest growing airports, Tyler Pounds Field also made the list of top 100 general aviation airports as ranked by operations. It is ranked 73rd and is classified as a non-hub tower.

General aviation instrument operations at combined FAA and contract tower airports (19.7 million) declined a second consecutive year, falling 0.2 percent. Prior to 2001, general aviation instrument operations had recorded increased activity levels in 6 of 7 years, with activity gains totaling 19.2 percent over the period.

The number of general aviation aircraft handled at en route centers (8.2 million) was up 1.9 percent in 2002, this following 2 consecutive years of declining activity. The increase in 2002 is due, in part, to the restrictions placed on VFR flying in the aftermath of September 11th, forcing more aircraft to file IFR flight plans.

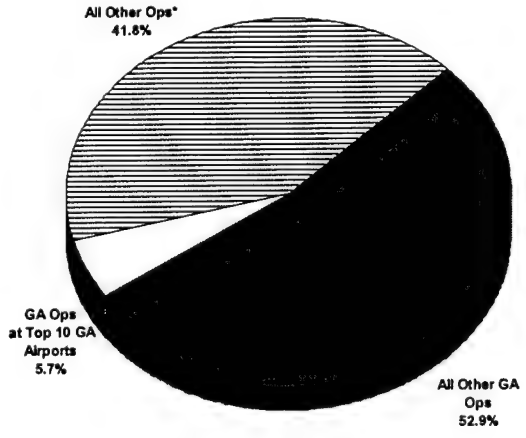
2001 GENERAL AVIATION AND AIR TAXI ACTIVITY SURVEY

The historical general aviation active fleet and hours flown discussed in this chapter and Chapter VI (Helicopters) are derived from the General Aviation and Air Taxi Activity (and Avionics) Survey (GA Survey). This survey is conducted annually (avionics questions are included every other year) by the FAA's Statistics and Forecast Branch. The fleet data are estimated using a sample from the FAA Aircraft Registry. As in any sample survey, variability could be caused by traditional sampling error and by nonsampling errors. With small groups (such as rotorcraft, turbojets, etc.), the estimates are heavily influenced not only by the number of respondents, but also by who responds. For example, if a large operator with high utilization rates for a particular aircraft type

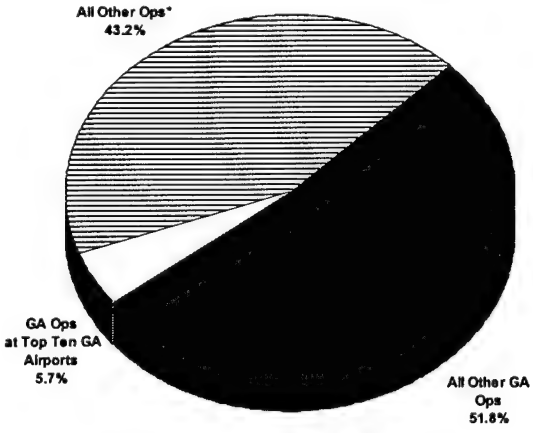
LARGEST GENERAL AVIATION AIRPORTS RANKED BY FY 2002 AIRCRAFT OPERATIONS

Facility ID	City/Airport	2002	2001
VNY	Van Nuys	482,960	433,590
DVT	Phoenix-Deer Valley Municipal	390,287	332,400
APA	Denver/Centennial	381,256	327,309
DAB	Daytona Beach International	349,210	362,506
SFB	Orlando/Sanford	345,007	385,247
PRC	Prescott/E A Love Field	334,007	313,109
LGB	Long Beach/Daugherty Field	328,952	344,937
RVS	Tulsa/Riverside	323,551	312,627
SNA	Santa Ana/John Wayne	277,363	284,343
GFK	Grand Forks International	270,596	248,592
	Operations -- Top 10 GA Airports	3,483,235	3,290,120
	Total GA Operations	37,545,941	37,626,891

PERCENT OF AIRCRAFT OPERATIONS BY TYPE OF AIRCRAFT OPERATIONS



2002



2001

*Includes air carrier, air taxi/commuter, and military operations.

responded to the survey one year but not the next, the effect would be to reduce the activity estimates for that particular aircraft type. This would happen even if that operator had no change in activity for that particular year.

To improve the response, the survey has been accompanied by a letter with the logos of eight general aviation associations indicating that they value the results and endorse the survey. The survey packet also states that that the "responses are completely confidential and will be used for statistical tabulation only." This is thought to have improved the quality of the responses, i.e., respondents were more likely to report their true activity rather than reporting that the aircraft did not fly during the past year. The usable response rate has remained above 50 percent although in recent years the number of postmaster returns--due to incorrect addresses--has reduced the response rate.

Several changes have been made to the survey, which have caused some discontinuities in the historical series. For a description and discussion of changes to the surveys conducted in 1993 through 2000, please refer to previous year's forecast publications. Also, with the processing of the 1997 survey data, changes in edits and estimation resulted in substantial upward revisions in survey estimates of fleet size and hours for 1995 and 1996. Estimates for earlier years were not revised and so may not be comparable to those for 1995 and later years.

Since one of the most critical uses of the GA Survey results is in the estimation of general aviation aircraft utilization—annual hours flown per aircraft--the 2000-01 GA Survey samples were allocated so as to improve the precision of the hours flown estimates, i.e., to minimize the variability in the estimates of hours flown.

The results of the 2001 survey for active fleet and hours flown, by aircraft type for the period 1996 to 2001, are detailed in Tables V-2 and V-3 which appear later in this chapter.

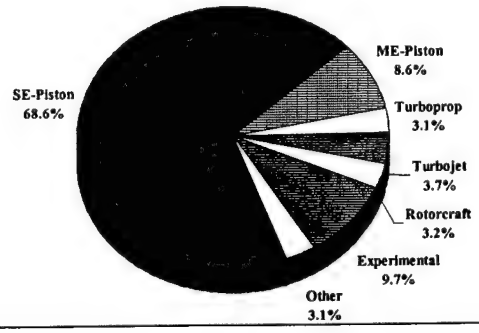
The 2001 survey results for active general aviation aircraft, collected during 2002, are reported as of December 31, 2001. The 2001 survey results for hours flown, collected during 2002, are reported as calendar year (CY) 2001.

ACTIVE AIRCRAFT

Based on the results of the 2001 GA Survey, there are an estimated 211,447 active general aviation aircraft[5]. This represents a 2.8 percent decrease in the active fleet. This was the 2nd straight year of recorded decline following 5 consecutive years of growth. However, this is still a 9.9 percent increase over the 1997 figure of 192,414 active general aviation aircraft.

Single-engine piston aircraft continue to dominate the fleet in 2001, accounting for 68.6 percent of the total active fleet. The next largest groups are experimental aircraft (9.7 percent) and multi-engine piston (8.6 percent). Turboprops, rotorcraft, and turbojets make up relatively small shares of the active fleet, accounting for 3.1, 3.2, and 3.7 percent, respectively.

ACTIVE GENERAL AVIATION AIRCRAFT PERCENT BY AIRCRAFT TYPE IN 2001



The 2001 GA Survey results for individual aircraft categories are as follows:

[5] An active aircraft is an aircraft flown at least one hour during the survey calendar year – i.e., one hour in 2001.

- The number of active fixed-wing piston aircraft totaled 163,315, down 4.2 percent;
  - single-engine piston aircraft decreased from 149,422 to 145,034, down 2.9 percent; and
  - multi-engine piston aircraft decreased from 21,091 to 18,281, down 13.3 percent.

- The number of active fixed-wing turbine aircraft totaled 14,383, up 12.7 percent;
  - turboprop aircraft increased from 5,762 to 6,596, up 14.5 percent; and
  - turbojet aircraft increased from 7,001 to 7,787, up 11.2 percent.

- The active rotorcraft fleet totaled 6,783, down 5.1 percent;
  - turbine-powered rotorcraft increased from 4,470 to 4,491, up 0.5 percent; and
  - piston-powered rotorcraft decreased from 2,680 to 2,292, down 14.5 percent.

- Active experimental aircraft totaled 20,421, an increase of 14 aircraft;
  - Amateur-built decreased from 16,739 to 16,736, a decrease of three aircraft,
  - exhibition aircraft increased from 1,973 to 2,052, up 4.0 percent, and
  - other experimental aircraft decreased from 1,694 to 1,633, down 3.6 percent.

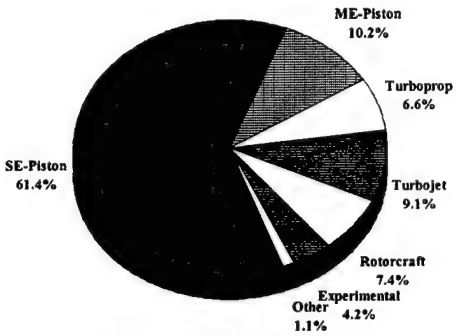
- The "other aircraft" category decreased from 6,700 to 6,545, down 2.3 percent;
  - gliders decreased from 2,041 to 1,904, down 6.7 percent, and
  - lighter-than-air aircraft increased from 4,600 to 4,641, up 0.9 percent.

HOURS FLOWN

Based on the results of the 2001 GA Survey, the hours flown by general aviation aircraft totaled 29.1 million, down 5.9 percent from the 30.9 million reported for 2000, the second consecutive year of decline. *Prior to 2001, the number of hours flown by general aviation aircraft had increased for 5 consecutive years. However, general aviation hours flown are still up 9.5 percent over the 6-year period.*

The following graphic shows that higher utilization rates provide turboprops, turbojets and rotorcraft a disproportionate share of the total hours flown. These three aircraft categories account for nearly 27 percent of total hours flown, but only approximately 10 percent of the active fleet.

ACTIVE GENERAL AVIATION AIRCRAFT PERCENT HOURS FLOWN 2001



The 2001 Survey results for the individual aircraft categories are as follows:

- Hours flown by fixed-wing piston aircraft (71.7 percent of total hours flown) totaled 20.9 million, a decrease of 5.9 percent;
  - single-engine piston aircraft hours (17.9 million) were down 4.8 percent, and
  - multi-engine piston aircraft hours (3.0 million) decreased by 12.2 percent.

- Hours flown by fixed-wing turbine aircraft totaled 4.6 million hours, a decrease of 4.5 percent, and
  - hours flown by turboprop aircraft were down 5.8 percent, and
  - hours flown by turbojet aircraft were down 3.5 percent.

- Rotorcraft hours flown (2.1 million) were down 7.2 percent from 2000;
  - turbine-powered rotorcraft flew 1.6 million hours (down 12.3 percent), and
  - piston-powered rotorcraft flew 0.6 million hours (up 9.7 percent).

- The number hours flown by experimental aircraft (1.2 million) decreased by 7.1 percent in 2001.

GENERAL AVIATION AS AN INDUSTRY

General aviation continues to be a vital part of aviation in the United States. At year-end 2001 there were 19,281 civil and joint use airports/heliports in operation, with 5,317 available for public use. Of these, 651 airports had commercial service certificates (also used by general aviation). This leaves a total of 18,630 airports/heliports (96.6 percent) used exclusively by general aviation aircraft, with 4,666 available for public use.

General aviation represents the largest percentage of civil aircraft in the United States and accounts for the majority of operations handled by towered and non-towered U.S. airports, as well as for the aircraft, and 2,363 regional/commuter aircraft (including regional jets).

Of the approximately 657,000 certificated pilots at the end of 2002, private pilots accounted for about 40 percent of the total. In addition, it is estimated that general aviation itinerant and local operations totaled 88.8 million in FY 2002, 72.6 percent of the total 122.3 million operations at towered and non-towered U.S. airports.

REALISM IN THE INDUSTRY

August of 2002 marked the 8th year since the passage of the General Aviation Revitalization Act (GARA). Since that time, general aviation shipments and billings have more than doubled. The General Aviation Manufacturers Association (GAMA) estimates that, in the manufacturing sector, 25,000 jobs had been created as a result of GARA. However, the 2001 economic recession, combined with the lingering effects of the events of September 11th, have resulted in the loss of some jobs in general aviation manufacturing.

The strength of general aviation's recovery and the positive outlook throughout the industry are being seriously challenged by the weakness in the U.S. economy. Whether GARA, which brought product liability reform to the industry, and the introduction of new aircraft models will be enough to see the industry through these uncertain times is difficult to predict at this time.

A sign for a pessimistic viewpoint is the fact that general aviation sales, with 465 fewer deliveries in 2002, fell from last year's near-record $8 billion to approximately $6.9 billion (down 13.8 percent).[6]

J.P. Morgan has stated[7], "Recent news flow confirms our long-held negative outlook for the business jet market." However, "Despite soft business jet demand, Cessna has sold more than 100 Sovereigns in the midsize cabin segment."[8]

Optimism can be gained by the continued entry of commercial manufacturers into the general

[6] 2001 Year-End Review and 2000 Forecast, Aerospace Industries Association, December 2001.
[7] US Equity Research; Aerospace and Defense; August 2002.
[8] Aviation Week & Space Technology; January 20, 2003; page 42.

TABLE V-2

GENERAL AVIATION ACTIVE AIRCRAFT BY AIRCRAFT TYPE

(In Thousands)

AIRCRAFT TYPE	2001	2000	1999	1998	1997	1996 1/
Fixed Wing - Total	**177.7**	**183.3**	**184.7**	**175.2**	**166.8**	**163.7**
Piston -- Total	**163.3**	**170.5**	**171.9**	**163.0**	**156.1**	**153.6**
One Engine	145.0	149.4	150.9	144.2	140.0	137.4
Two Engine	18.2	21.0	20.9	18.7	15.9	16.1
Other Piston	0.1	0.1	0.1	0.1	0.1	0.1
Turboprop -- Total	**6.6**	**5.8**	**5.7**	**6.2**	**5.6**	**5.7**
Single Engine	1.0	0.7	1.0	1.0	0.7	0.7
Two Engine	5.6	5.0	4.6	5.1	4.9	4.9
Other Turboprop	0.0	0.0	0.0	0.1	0.0	0.1
Turbojet -- Total	**7.8**	**7.0**	**7.1**	**6.1**	**5.2**	**4.4**
Two Engine	7.0	6.2	6.4	5.5	4.6	4.1
Other Turbojet	0.8	0.8	0.7	0.6	0.5	0.3
Rotorcraft -- Total	**6.8**	**7.2**	**7.4**	**7.4**	**6.8**	**6.6**
Piston	2.3	2.7	2.6	2.5	2.3	2.5
Turbine	4.5	4.5	4.9	4.9	4.5	4.1
Single Engine	3.6	3.8	4.0	4.0	3.8	3.4
Multi-engine	0.8	0.7	0.8	0.8	0.8	0.6
Other -- Total	**6.5**	**6.7**	**6.8**	**5.6**	**4.1**	**4.2**
Experimental -- Total	**20.4**	**20.4**	**20.5**	**16.5**	**14.7**	**16.6**
Total All Aircraft	**211.4**	**217.5**	**219.4**	**204.7**	**192.4**	**191.1**

SOURCE: 1996 - 2001 General Aviation Activity and Avionics Surveys.

1/ Estimates have been revised to reflect changes in edit and estimation procedures,

TABLE V-3

TOTAL GENERAL AVIATION HOURS FLOWN BY AIRCRAFT TYPE
(In Thousands)

AIRCRAFT TYPE	2001	2000	1999	1998	1997	1996 1/
Fixed Wing - Total	**25,454**	**26,986**	**27,444**	**24,392**	**24,111**	**23,402**
Piston -- Total	**20,883**	**22,199**	**22,895**	**20,402**	**20,743**	**20,091**
One Engine	17,898	18,798	19,325	16,823	18,345	17,606
Two Engine	2,924	3,372	3,551	3,567	2,380	2,474
Other Piston	61	28	18	11	19	11
Turboprop -- Total	**1,913**	**2,031**	**1,811**	**1,765**	**1,655**	**1,768**
Single Engine	299	278	357	289	321	328
Two Engine	1,597	1,727	1,450	1,459	1,326	1,419
Other Turboprop	17	26	4	17	9	22
Turbojet -- Total	**2.658**	**2,755**	**2,738**	**2,226**	**1,713**	**1,543**
Two Engine	2,356	2,338	2,435	1,995	1,557	1,385
Other Turbojet	302	417	303	231	155	158
Rotorcraft -- Total	**2,141**	**2,308**	**2,744**	**2,342**	**2,084**	**2,122**
Piston	583	531	556	430	344	591
Turbine	1,559	1,777	2,188	1,912	1,740	1,531
Single Engine	1,203	1,424	1,744	1,415	1,311	1,282
Multi-engine	355	353	443	497	429	249
Other -- Total	**324**	**374**	**318**	**295**	**192**	**227**
Experimental -- Total	**1,214**	**1,307**	**1,247**	**1,071**	**1,327**	**1,158**
Total All Aircraft	**29,133**	**30,975**	**31,754**	**28,100**	**27,713**	**26,909**

SOURCE: 1996 - 2001 General Aviation Activity and Avionics Surveys.

1/ Estimates have been revised to reflect changes in edit and estimation procedures, and may not be comparable to estimates prior to 1995.

Columns may not add to totals due to rounding and estimation procedures.

aviation aircraft market, and the fact that some kit builders are becoming production companies at the entry level.

Since their start in the 1980s, fractional ownership providers have steadily increased their customer base. According to from AvDataInc of Wichita, Kansas, at the end of 2001 there were nearly 3,500 entities 5,000 shares involved in fractional ownership of more than 650 aircraft. Despite this record growth, it is believed only a small percentage of this market has been developed.

Fractional ownership providers offer the customer a more efficient use of time by providing faster point-to-point travel and the ability to conduct business while in transit. In addition, shareholders of fractional ownerships find the minimum startup concerns and easier exiting options of great benefit.

While the fractional ownership fleet and shareholders have been growing, so too have the turbine business fleet and flight departments of Corporate America. According to AvDataInc, the corporate fleet numbers 14,800 and includes almost 9,500 flight departments. From 1993 to 2001, AvDataInc states that the corporate aircraft fleet grew at an annual rate of 5.6 percent while the number of business flight departments grew at an annual rate of 4.6 percent.

The business aviation community was initially concerned that the success of fractional ownership programs would result in a shut down of corporate flight departments. These concerns have not come to fruition. Fractional ownership providers generally find their business base to be first-time users of corporate aircraft services, users that traditionally utilized commercial air transportation services. Once introduced to the benefits of corporate flying, some users of fractional programs have found it more cost beneficial to start their own flight departments, instead of incurring the costs of a larger share in a fractional ownership program. As such, the fractional ownership community may be partially responsible for the increase in traditional flight departments since 1993.

The number of amateur-built experimental aircraft in the general aviation fleet has increased consistently for more than a quarter of a century, from 2,100 in 1970 to over 20,000 active today. It is estimated that more than 75 percent of these are active aircraft.

The popularity of the amateur-built aircraft results from several factors, including affordability and performance. Amateur-built experimental aircraft represent a test-bed for new technologies that will eventually be introduced in the development and manufacture of the next generation of light general aviation production aircraft. The success of the kit aircraft market demonstrates that demand still exists for affordable aircraft.

The overall general aviation accident rate per 100,000 flying hours has declined over the past 25 years. The National Transportation Safety Board's (NTSB) preliminary estimate for 2001 is 5.96 general aviation accidents per 100,000 hours flown—the lowest figure recorded for general aviation since 1938, the first year for reporting of accident statistics. This is down from the 6.49 revised rate for 2000. This continues the trend for the general aviation accident rate, which has been declining since 1994.

FAA/Government Programs/Initiatives

The partnership between the FAA and the general aviation community is a continuous joint effort aimed at fostering industry improvements and aviation safety.

FAA Administrator Marion Blakey has indicated that the agency will continue to

support safety improvements in general aviation. To this end, a safety program called "Safer Skies" has been established and continues. Together with industry, the FAA will use the latest technology to analyze U.S. and global data to find the root causes of accidents so as to determine the best actions for breaking the chain of events that lead to accidents. For general aviation, this means the FAA will embark on major data improvements, including quality, collection, and analysis.

As part of the "Safer Skies" effort, the General Aviation Joint Steering Committee (GA JSC) chartered a joint government/industry group called the General Aviation Data Improvement Team (GADIT). The GADIT was established to develop strategies to "increase detail about factors that have contributed to or caused general aviation accidents and incidents;" to "improve the quality and timeliness of estimates of general aviation activity;" and to "suggest alternative and innovative ways to measure the effectiveness of *Safer Skies* interventions for general aviation." The GADIT has been organized to address four areas: activity data, accident data, incident data, and metrics.

The accident data task team has produced an interim paper on "GADIT Accident Data Needs," an analysis of data needs arranged into high, medium, and low categories. Items may be added to the list as necessary. This is the first stage in the accident data activity. The next step is to develop solutions for evaluating and gathering/collecting accident data.

The FAA, the National Aeronautics and Space Administration (NASA), industry, and other government agencies and universities, are working together to improve the safety and efficiency in our transportation system. To this end, NASA and FAA have implemented the Small Aircraft Transportation System (SATS). The National General Aviation Roadmap is a 25-year strategy for developing SATS. It is believed that the SATS can satisfy 21st century transportation demand by relieving pressure on existing ground and air systems, and by creating access to more communities in less time.

FAA and NASA have also collaborated with the general aviation community in research programs aimed at fostering new technologies in general aviation. Two such programs are AGATE (Advanced General Aviation Transportation Experiments) and GAP (General Aviation Propulsion).

The AGATE Consortium provides a unique partnership between government, industry, and academia. The goal of AGATE is to utilize new technology to produce aircraft that are safer, easier to operate, and more affordable to today's pilot. This will be accomplished through utilization of improved avionics, more crashworthy airframes, and pilot training. NASA's GAP program focuses on development of improved piston and turbine engines.

One of the goals of FAA's Safer Skies initiative is to improve weather and other flight information. The Flight Information Service (FIS) program plans to put real time weather information in the cockpit.

The NASA "Highway in the Sky" project has a goal of putting 21st Century instrumentation into the cockpit--including GPS position and weather displays. Affordable computers will provide an "intuitive pictorial of situational awareness," allowing display a "highway" to a preprogrammed destination.

The FAA is also committed to improving navigation through satellite-based systems such as the Global Positioning System (GPS) for airport precision approach. Most IFR aircraft are expected to have GPS/WAAS (Wide Area Augmentation System) by 2005. The expected increase in the number of general aviation aircraft equipped with GPS/WAAS and other avionics and communications gear such as Automatic Dependent Surveillance–Broadcast (ADS-B) and 8.33 kHz (radio) channel spacing

should be evidenced in avionics tables included in the GA Survey over the next few years.

Manufacturer and Industry Programs/Initiatives

The fractional ownership industry was started in 1986 and since that time has provided corporate flying services to companies that could not otherwise justify the costs associated with operating a separate flight department. During this time, fractional owner-ship providers have operated under Federal Aviation Regulation (FAR) Part 91, which governs general aviation.

The FAA established a formal rulemaking committee, consisting of members from aircraft manufacturers, corporate flight departments, charter operators, fractional owner providers and their customers, and business aircraft management companies. The committee reviewed current Federal Aviation Regulations regarding fractional ownership activity and drafted a proposal that would require fractional ownership aircraft to operate under subpart K of Part 91.

The proposal was submitted to the FAA and analyzed to assess the economic impact of the proposed rule. The notice of proposed rulemaking was issued during the middle of 2001. After a time extension for filing of comments, the comment period closed in November 2001. The FAA is in the process of developing the final rule and planning for its implementation.

Over the past several years, the general aviation industry has launched a series of programs and initiatives whose main goals are to promote and assure future growth within the industry. These include the "No Plane, No Gain" program sponsored jointly by GAMA and the NBAA; "Project Pilot" sponsored by the Aircraft Owners and Pilots Association (AOPA); the "Flying Start" program sponsored by EAA; and "BE A PILOT."

"No Plane, No Gain" is an advocacy program created in 1992 by GAMA and NBAA to promote acceptance and increased use of business aviation. The program promotes business aviation as a cost-effective tool for increasing the efficiency, productivity, and profitability of companies.

AOPA's "Project Pilot" promotes the training of new pilots in order to increase and maintain the size of the pilot population. AOPA believes students that have mentors offering advice and help as training progresses are more likely to complete their training than students who don't have mentors.

The "BE A PILOT" program is jointly sponsored and supported by more than 100 industry organizations. The program, which started in 1996, has a multi-faceted approach: (1) create an influx of new pilots; (2) generate flight training leads; (3) encourage improvement in flight school marketing; and (4) secure additional funding to expand the effort. "BE A PILOT" started issuing "introductory flight certificates" to interested respondents in May 1997. Most probably, the program will have to expand to address public concerns about flight training and aviation security.

The program has been supported by general aviation manufacturers and other aviation businesses and organizations. In the latter part of 2001, the "BE A PILOT" moved the program to a higher level of activity and effort by hiring a full-time president and chief executive.

Industry organizations have developed programs and outreach efforts to attract young people through the Internet to peak their interest in the world of aviation. The NBAA sponsors "AvKids," a program designed to educate elementary school students about the benefits of business aviation to the community, and career opportunities available to them in business

aviation. GAMA offers publications, awards, and scholarships to bring education into the nation's classrooms.

GENERAL AVIATION FORECASTS

The general aviation forecasts discussed in the following paragraphs are based on a set of economic assumptions that includes a strong recovery starting during the second half of 2003 and continuing through 2005, with moderate sustained growth thereafter. The decline in general aviation activity that started in late 2001 and continued through much of 2002 was exacerbated by the events following the terrorist attacks of September 11th. General aviation activity is expected to continue to experience slight declines in 2003, then return to more normal growth patterns beginning in 2004 as the U.S. economy reaches the peak of its recovery

The forecast also assumes that the regulatory environment affecting general aviation will not change dramatically, although certain segments of the industry may continue to be impacted by the "no-fly zones" around New York City and Washington, DC. Specifically, it is assumed that noise and emissions requirements on business turbine aircraft will remain within the bounds prescribed by current rules and regulations. The forecast also assumes that general aviation activity will not be subject to new user-fees or limited access to airports and airspace.

Finally, the forecast assumes that the fractional ownership market will continue to expand and bring new operators and shareholders into business aviation. The fractional ownership community is not expected to be inhibited by certification and regulatory requirements associated with the adoption of the new fractional ownership rule—Part 91, Subpart K.

To the extent that industry and government programs/initiatives are successful in expanding the market for general aviation products and services, the forecasts discussed in the following pages can to be achieved or possibly exceeded. If the economy rebounds strongly, the numbers for the active general aviation fleet, hours flown, and pilots could be higher than forecast.

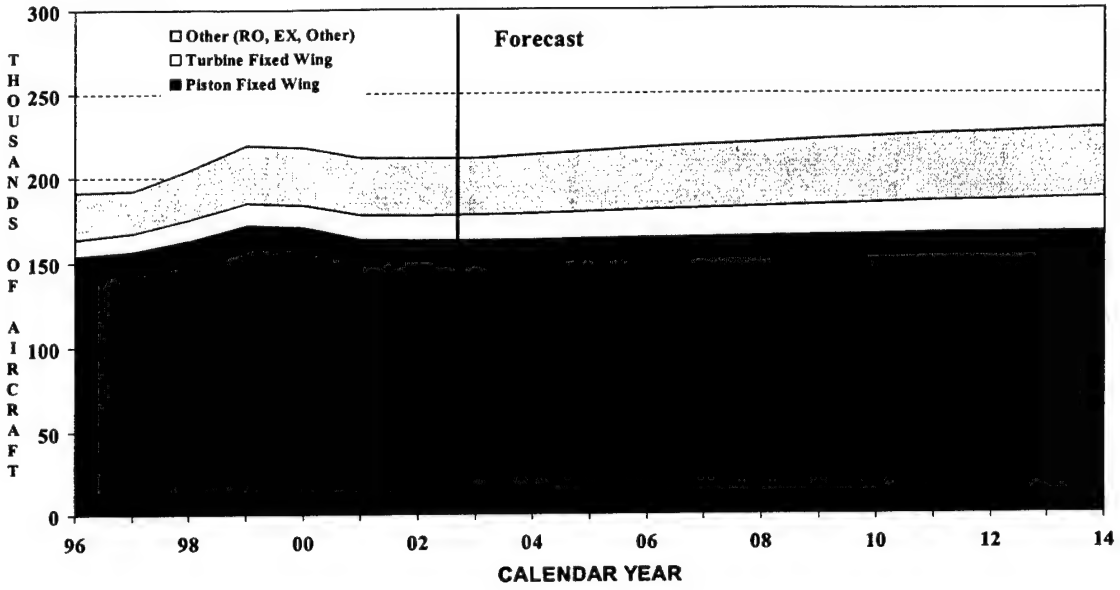
The current forecasts for the general aviation active fleet, hours flown, and fuel consumption use the data obtained from the 2001 survey as the base year. Therefore, the forecast period for the three activity measures extends from 2001 through 2014, and references to average annual growth rates for the forecast period include 13 years. Airmen forecasts are based on data for 2002, and references to average annual growth rates for the forecast period include 12 years.

ACTIVE FLEET

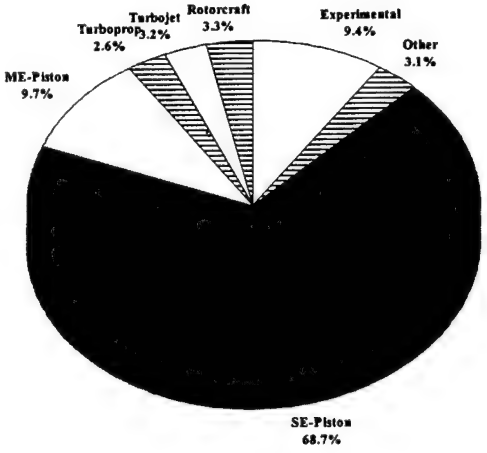
The forecasts of the active general aviation fleet are based, in large part, on the discussions at September 2002 FAA/Transportation Research Board International Workshop on Future Aviation Activities. The three panels most associated with general aviation consisted of the following: 1) Business Aviation 2) Vertical Flight and 3) Light Aviation. In any year, the size of the U.S. fleet is assumed to be the result of new production, the fleet carried over from the previous year, and attrition of existing aircraft during the current year. Attrition occurs from net exports, retirements, and write-offs. New production depends on economic growth and corporate profitability, the introduction of new products, and the prices of the new aircraft offered for sale.

The active general aviation aircraft fleet is forecast to increase from 211,447 in 2001 to 229,490 in 2014, an average of 0.7 percent per year over the 13-year forecast period. There seem to be two separate general aviation

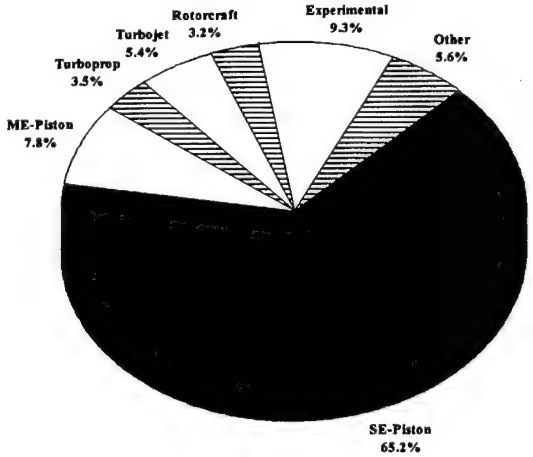
ACTIVE GENERAL AVIATION AND AIR TAXI AIRCRAFT



PERCENT BY AIRCRAFT TYPE



2001



2014

economies: turbojet/turboprop aircraft follow one market pattern; while piston, turboprop, rotorcraft, experimental aircraft follow a separate "growth" pattern.

The number of single-engine piston active aircraft is projected to decrease from 145,034 in 2001 to 144,500 in 2002, and then begin a period of slow recovery, reaching 149,600 in 2014. This represents average annual growth rate of 0.2 percent over the 13-year period.

The number active multi-engine piston aircraft fleet is expected to decline by 0.2 percent per year over the forecast period, totaling 17,810 in 2014. This decline is based on the attrition of approximately 35 aircraft annually.

The turbine-powered fleet is expected to increase at an average annual rate of 2.5 percent over the 13-year forecast period. The number of turboprop aircraft is forecast to grow 1.5 percent per year over the 13-year forecast period, increasing from 6,596 in 2001 to 8,020 in 2014. These forecasts assume that the turboprop fleet grows by approximately 105 aircraft per year, counting new production and attrition.

The turbojet aircraft fleet is forecast to grow an average of 3.6 percent annually, from 7,787 in 2001 to 12,300 in 2014. Several factors are responsible for the market for business jets. These include a strong recovery in both the U.S. and global economy; the success and continued growth in the fractional ownership market, new product offerings; and some shift from commercial air travel to corporate/business air travel by business travelers and corporations.

The new Eclipse aircraft has not been included in this year's forecasts because of uncertainties regarding engine certification. At the September 2002 FAA/TRB workshop, the Business Aviation Panel suggested that the market for the new Eclipse could add up to 5,000 aircraft to the active fleet by 2010. If the engine problems are resolved quickly, the active general aviation jet fleet could be significantly higher than forecast.

The rotorcraft fleet is forecast to grow only 0.7 percent annually over the 13-year forecast period, from 6,783 in 2001 to 7,390 in 2014. The turbine fleet is projected to grow at an annual rate of 0.2 percent (0.5 percent between 2003 and 2014), while the smaller piston fleet size is expected to grow at an annual rate of 1.6 percent. A detailed discussion of rotorcraft forecasts is presented in Chapter VI.

The number of experimental aircraft is projected to increase from 20,421 in 2001 to 21,450 in 2014, an average annual growth rate of 0.4 percent. Gliders and lighter-than-air aircraft are forecast to increase 0.2 percent annually, growing from 6,545 in 2001 to 6,720 in 2014.

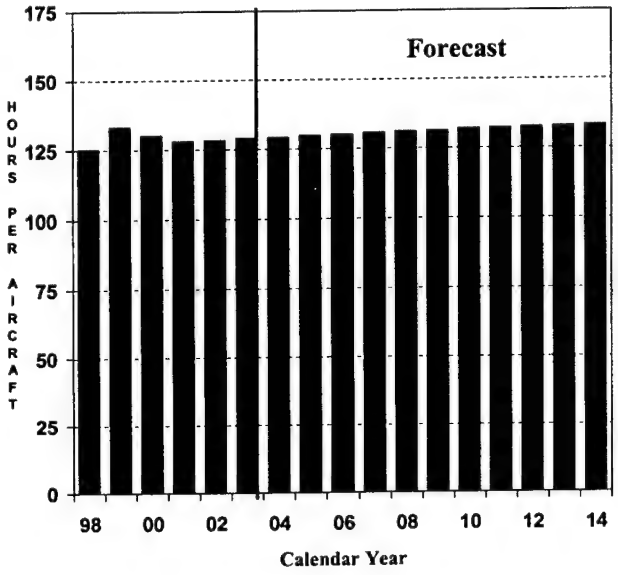
A new category--light sport aircraft--is expected to enter the active fleet in 2004 and to account for 6,200 aircraft in 2014. This includes approximately 2,000 existing ultralights not currently included in the FAA's aircraft registry count. These aircraft could be registered as light sport aircraft starting in 2004. In addition, it is assumed that approximately 330-500 newly manufactured light sport aircraft will enter the active fleet annually beginning in 2005.

AIRCRAFT UTILIZATION

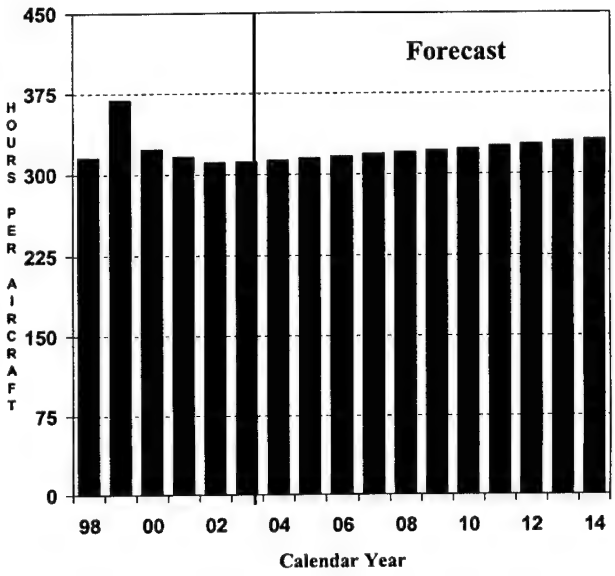
It is assumed that the aging of the general aviation fleet is one of the main determinants of declining utilization of general aviation aircraft. Based on results from the 2001 GA survey the average age of aircraft in the active general aviation fleet is estimated to be approximately 28 years, with piston aircraft accounting for the majority of the aging fleet. Data from the 2001 GA Survey shows that aircraft utilization peaks at about 197 hours for aircraft between 16 and 20 years old and then declines substantially after an aircraft reaches 20 years of age. The aging of

GENERAL AVIATION AIRCRAFT UTILIZATION: AVERAGE HOURS PER AIRCRAFT

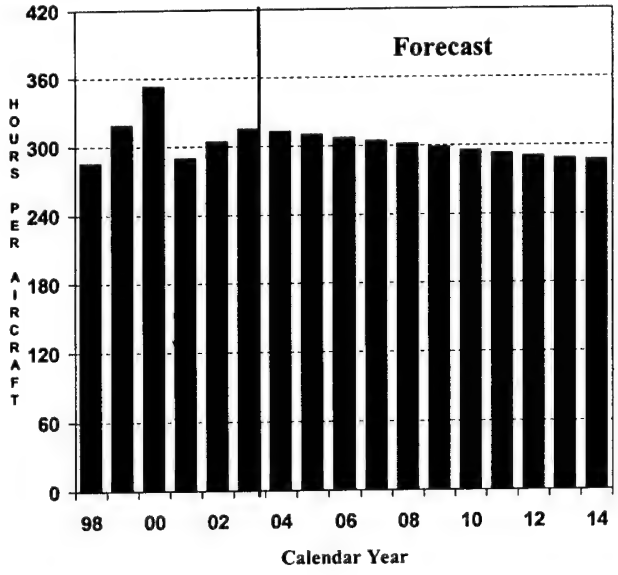
PISTON FIXED WING



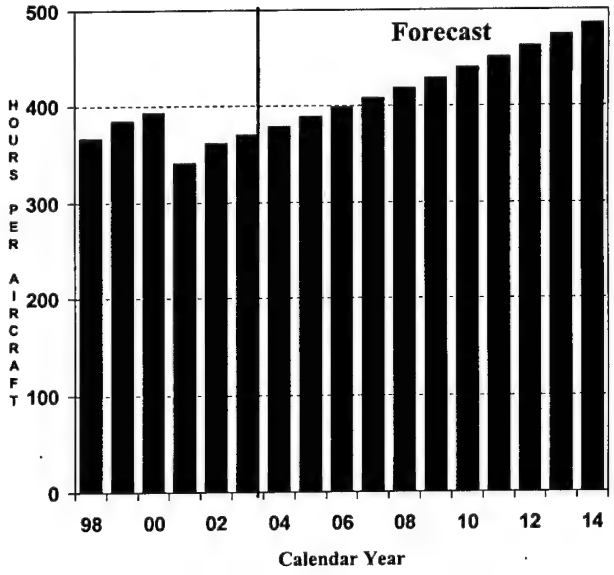
ROTORCRAFT



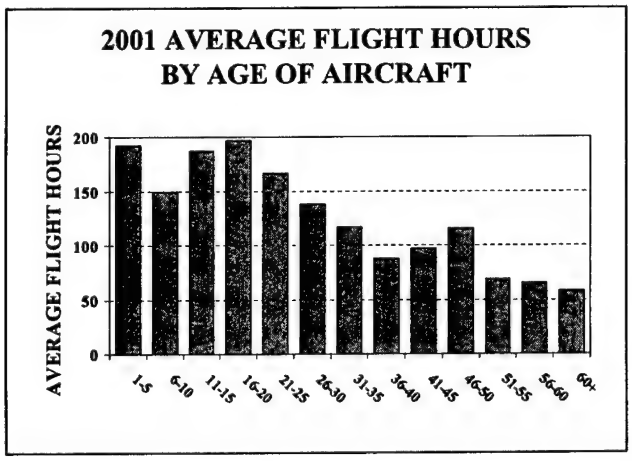
TURBOPROP



TURBOJET



the fleet appears to be one of the main causes of declining utilization of general aviation aircraft during the early and mid-1990s.



While part of the decline in utilization can be attributed to the aging of the general aviation fleet, U.S. economic slowdowns and/or recessions, such as those which occurred in 1990-91 and 2001-02 can also impact utilization. The declines in the utilization rates experienced in 2000 (down 1.6 percent) and 2001 (down 3.2 percent) are due, in part, to higher fuel prices and the 2001 U.S. economic recession. However, the restrictions placed on general aviation flying in the aftermath of the September 11th events also contributed to the decline in 2001.

The expected strong recovery in the U.S. economy starting in 2003 and beyond should increase the utilization rates for most categories of general aviation aircraft. In addition, new ownership strategies, and other approaches to make flying more desirable and affordable should also be positive forces on utilization rates during the forecast period.

For 2001, the utilization rate for single engine piston aircraft is estimated to be 123.4 hours per aircraft. Starting at this base, utilization rates for single-engine piston aircraft are projected to increase to 129.4 hours by 2014, an increase of 0.4 percent annually. However, this figure is only marginally higher than the corresponding number for 1999 (128.1 hours per aircraft).

The relatively small increase forecast for single-engine piston utilization rates results from the fact that utilization rates tend to be lower for older aircraft. With less than 2,000 new aircraft projected to enter the fleet annually, the single-engine piston fleet will "age" and, utilization rates should increase only marginally, if at all.

In 2001, multi-engine piston aircraft utilization rates are estimated to be 163.2 hours per aircraft. The utilization of multi-engine piston aircraft is forecast to increase to 165.4 hours in 2014, an increase of only 0.1 percent annually.

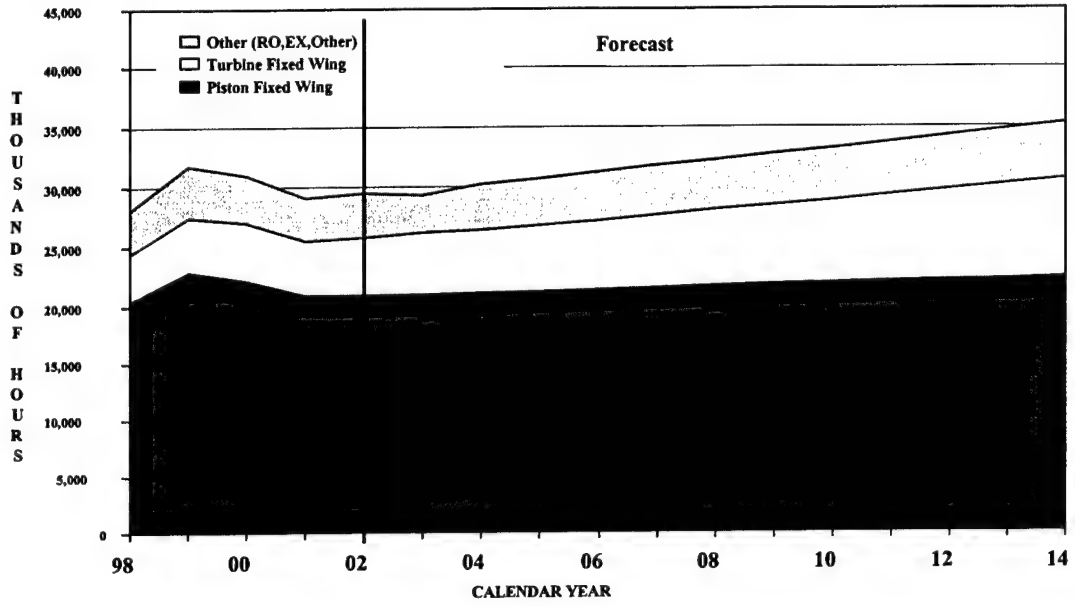
The utilization rates for both turboprops and turbojets both declined significantly in 2001, down 17.7 and 13.3 percent, respectively, owing, in large part, to the economic downturn and the events of September 11th. Turboprop utilization recovers some of the loss in 2002 (up 5.0 percent) and 2003 (up 3.6 percent), but declines by almost 1.0 percent annually over the remainder of the forecast period.

Turbojet utilization is projected to grow an average of 2.5 percent per year over the 13-year forecast period, from 341.3 hours in 2001 to 485.8 hours in 2014. The increase in utilization rates for turbojets is largely attributable to the increased number of aircraft being operated by fractional ownership providers. While the average corporate jet utilization is about 300 hours per year, it is estimated that utilization for fractional ownership aircraft is about 1,200 hours per aircraft.

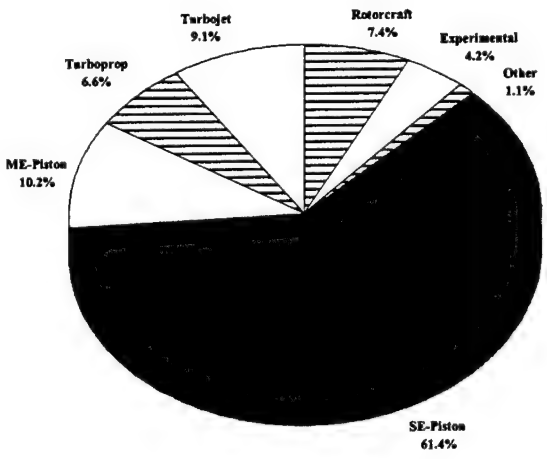
Rotorcraft utilization rates are expected to decline from 315.8 hours in 2001 to 310.3 hours in 2002. Thereafter, utilization increases at an average annual rate of 0.6 percent over the forecast period, reaching 1.3 million hours in 2014.

Utilization rates for experimental aircraft are basically flat over the forecast period, declining over the early years then increasing gradually over the remainder of the forecast period.

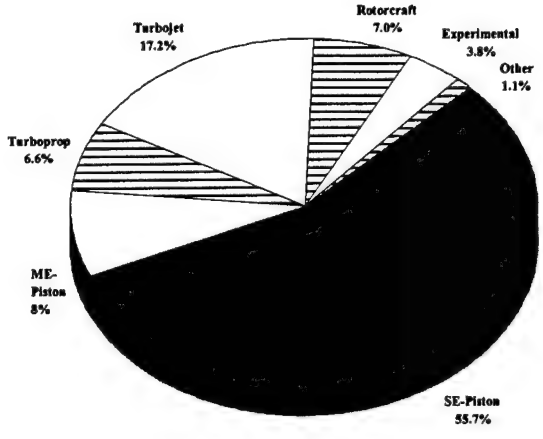
ACTIVE GENERAL AVIATION AND AIR TAXI HOURS FLOWN



PERCENT BY AIRCRAFT TYPE



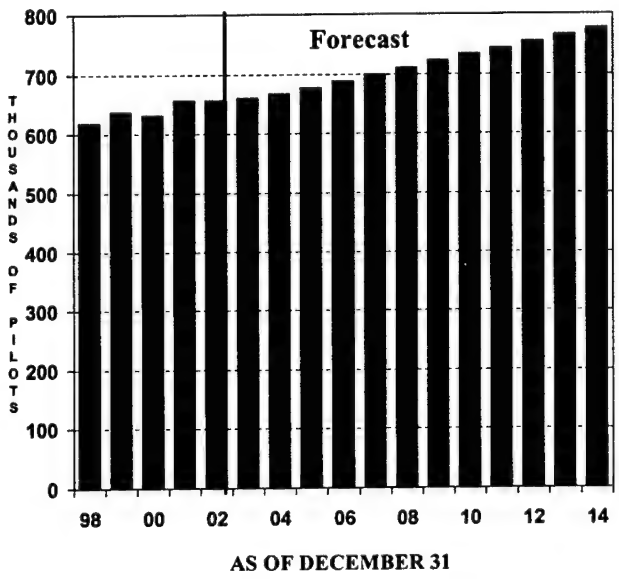
2001



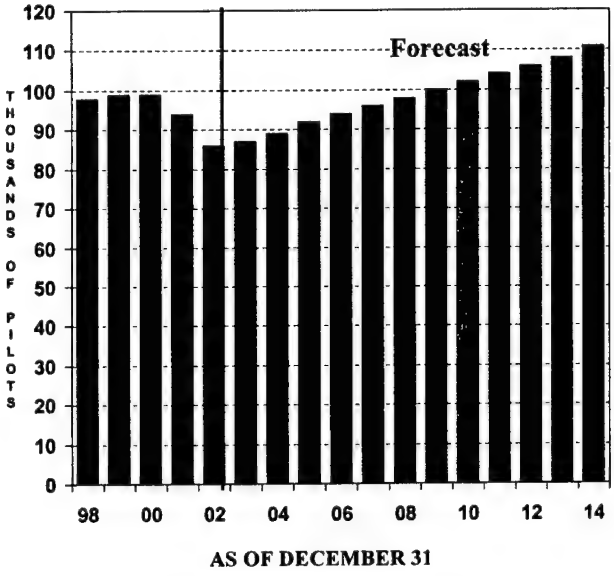
2014

ACTIVE PILOT TRENDS AND FORECASTS

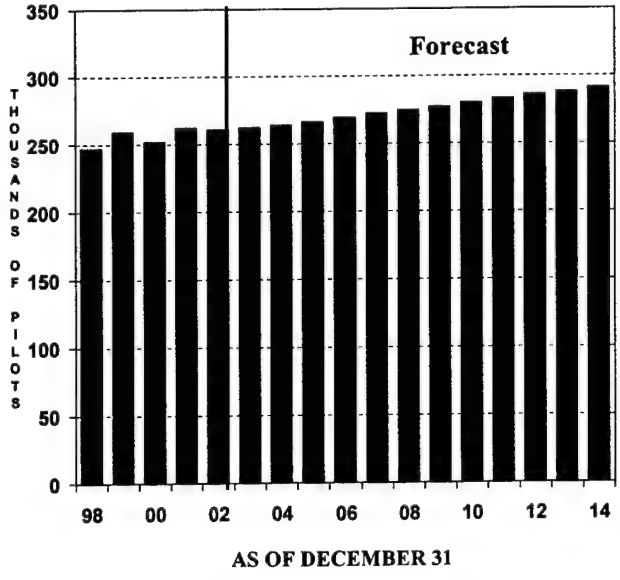
TOTAL



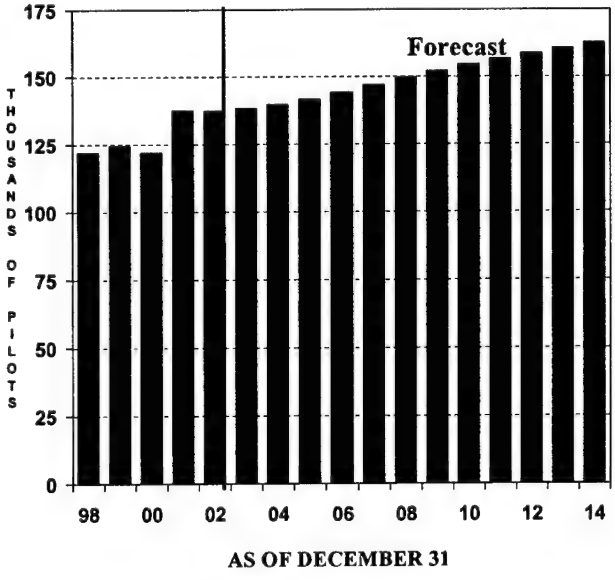
STUDENT

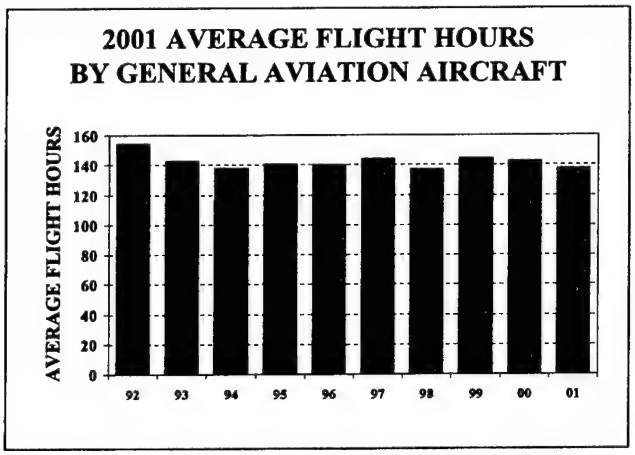


PRIVATE



COMMERCIAL





HOURS FLOWN

General aviation hours flown are forecast to increase by 1.5 percent annually over the 13-year forecast period--from 29.1 million in 2001 to 35.3 million in 2014.

Hours flown for single-engine piston aircraft are forecast to increase from 17.9 million in 2001 at an average annual rate of 0.6 percent over the forecast period. Multi-engine piston aircraft hours remain essentially constant from the base 2001 figure of 3.0 million in 2001.

Turboprop hours are expected to increase from 1.9 million in 2001 to approximately 2.3 million in 2014. Growth of about 5 percent is forecast for 2002 and 2003 and then average approximately 0.8 percent per year for the remainder of the forecast period. The relatively strong growth in 2002 and 2003 may be attributed, in part, to higher expected utilization rates. Turbojet hours are expected to increase from 2.7 million in 2001 to almost 6.0 million in 2014, an average annual increase of 6.2 percent.

Rotorcraft hours flown are forecast to increase approximately 1.0 percent annually over the forecast period, from 2.1 million in 2001 to 2.4 million in 2014. Experimental aircraft hours increase at an annual rate of 0.6 percent over the 13-year forecast period, reaching 1.3 million hours in 2014. The new light sport aircraft category is expected to total 558,000 hours in 2014.

PILOT POPULATION

The total pilot population is projected to increase from an estimated 657,000 in 2002 to 775,695 by 2014, an annual increase of 1.4 percent over the 12-year forecast period. Annual growth rates for the major general aviation pilot categories are: student pilots, up 2.1 percent annually; private pilots, up 0.9 percent annually; and commercial pilots, up 1.4 percent annually.

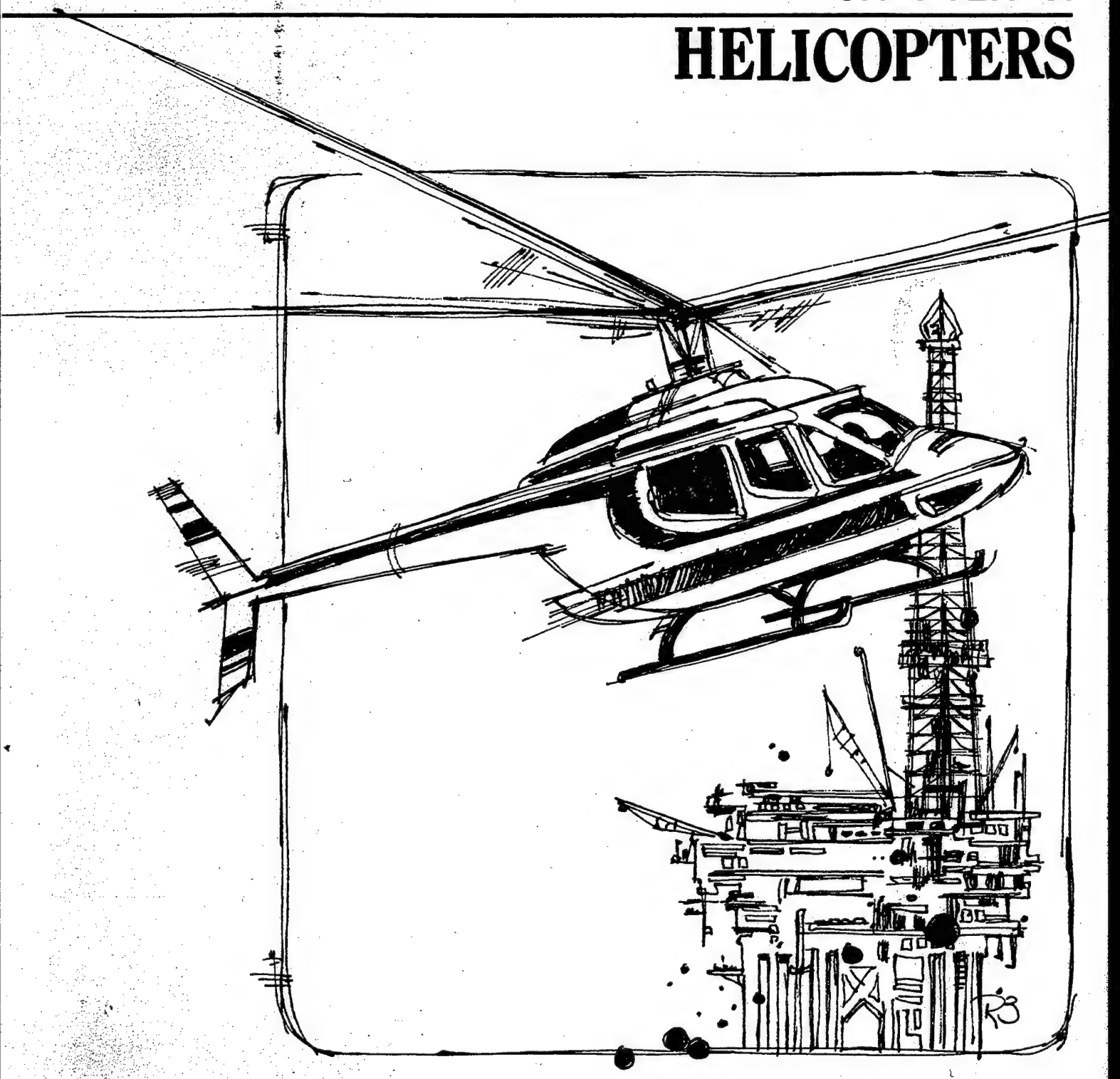
The student pilot population is expected to increase modestly in 2003 (up 1.0 percent) and 2004 (up 2.0 percent), and then grow by 3.5 percent in 2005 and 2.8 percent in 2006. Thereafter, growth returns to 2.0 percent annually over the remainder of the forecast period. The relatively large increase in 2005 and 2006 are due in large part to anticipated response to the new sport pilot certificate. This new category of pilot certificate will make it more economical to learn to fly, thereby attracting more student pilots.

Growth rates for the other pilot categories over the forecast period are: airline transport pilots, up 1.9 percent; recreational, up 0.6 percent; rotorcraft only, up 1.0 percent; and glider, up 0.3 percent.

The number of instrument rated pilots is expected to increase from 321,000 in 2002 to 390,600 in 2014, a 1.6 percent average annual rate of growth.

In 2002, 48.9 percent of all pilots are instrument rated. By 2014, this figure rises to 50.4 percent. This is largely the result of increased numbers of pilots holding commercial and airline transport ratings.

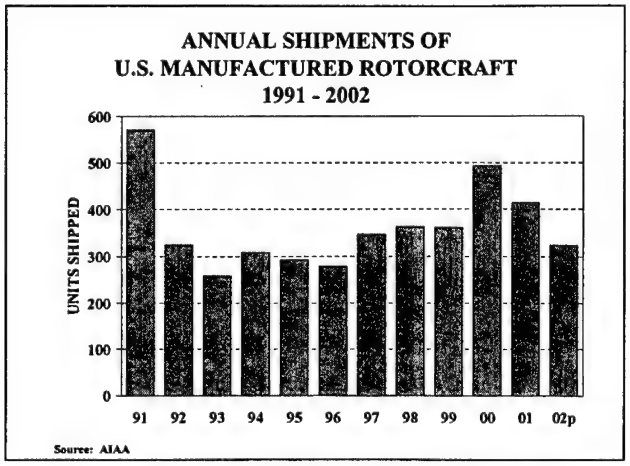
CHAPTER VI
HELICOPTERS



CHAPTER VI

HELICOPTERS

Helicopters participate in a wide range of aviation activities, which are not only important, but contribute to the nation's economy as well. These activities include aerial observation; sightseeing; agricultural application; law enforcement; fire fighting; personal transportation; emergency medical services; transporting personnel and supplies to offshore oil rigs; traffic reporting; electronic news gathering; corporate or business transportation; and heavy lift for the oil, utility, and lumber industries.

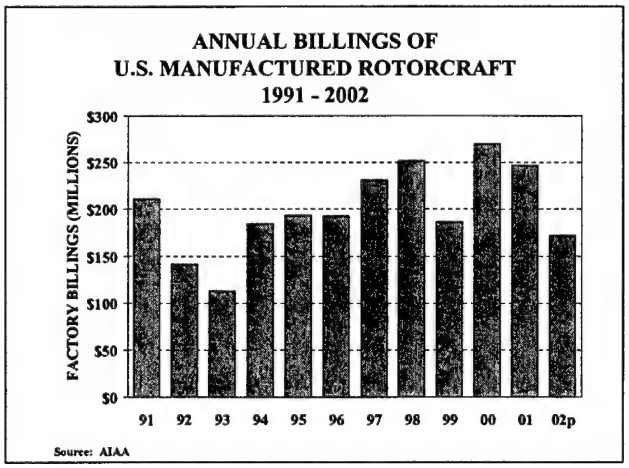


REVIEW OF 2001-2002

SHIPMENTS

Preliminary data for calendar year 2002 reported by the Aerospace Industries Association of America (AIAA)[1] indicate that shipments of new U.S. civil helicopters will total 323 units. Compared to the 415 units shipped in 2001, this represents a decrease of 22.2 percent.

The value of the helicopter shipments totaled $172 million in 2002, a decrease of 30.4 percent from billings of $247 million in 2001.



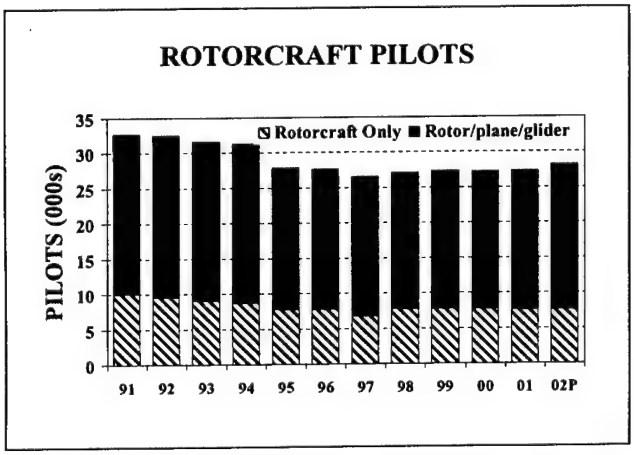
Over the past 5 years, the average value per helicopter shipped has ranged from a high of

[1] 2002 Year-End Review and 2003 Forecast—An Analysis, Aerospace Industries Association of America, December 2002.

$694,000 in 1998 to a low of $533,000 in 2002. This declining value reflects the shipment of greater numbers of lower priced piston aircraft. Another factor affecting the sales and shipment figures reported by AIAA is that they do not include U.S. imports from foreign manufacturers.

PILOTS

The total rotorcraft pilot population includes pilots who are certificated to operate only rotorcraft (helicopters and gyrocopters) as well as those that may operate rotorcraft as well as other airplanes and/or gliders. The total number of rotorcraft pilots has increased from 25,849 in 1998 to 28,000 in 2001--a 3-year increase of 8.3 percent. The number for 2002 is expected to be about 28,000. The number of pilots who are certificated to fly only rotorcraft increased from 7,727 in 2001 to 7,770 in 2002 (up 0.6 percent).



2001 GENERAL AVIATION AND AIR TAXI ACTIVITY SURVEY

The historical rotorcraft active fleet and hours flown discussed in this chapter are derived from the General Aviation and Air Taxi Activity Survey (GA Survey). This survey is conducted annually by the FAA Statistics and Forecast Branch. The fleet and hours flown data are estimated using a sample of general aviation aircraft from the FAA Civil Aviation Registry. As in any sample survey, variability can be caused by traditional sampling errors and by non-sampling errors. With small groups such as rotorcraft, the estimates are heavily influenced not only by the number of respondents, but also by who responds. For example, if a large operator with high utilization rates for a particular aircraft type elects to respond one year but not the next, the effect would be to reduce the activity estimates for that particular aircraft type in the second year. This would occur even if that operator had no change in activity.

The active rotorcraft fleet and hours flown by aircraft type are detailed for the period 1996 to 2001 in Chapter V, Tables V-2 and V-3. The 2001 survey results for active rotorcraft and hours flown are also listed in Chapter X, Table 33. The 2001 survey results for active rotorcraft are reported as of December 31, 2001 in the tables. The 2001 survey results for rotorcraft hours flown are reported as calendar year 2001.

FLEET AND HOURS FLOWN

Based on the 2001 Survey, there were 6,783 active civil rotorcraft in the United States, a decrease of 5.1 percent from the 7,150 rotorcraft reported for 2000. However, this still represents a 3.2 percent increase over the 6,570 rotorcraft reported for 1996. In 2001, the estimate of the number of active turbine rotorcraft is 4,491—an increase of 0.5 percent from the 2000 estimate, and 9.5 percent more than the estimate for 1996. In 2001 there were 2,292 active piston rotorcraft, a decrease of 14.5 percent from the 2000 estimate of 2,680, but up 1.5 percent from the 1997 estimate of 2,259.

It must be noted that the 2,292 figure must be viewed with some caution; it may be a statistical anomaly.

At the FAA/Transportaion Research Board (TRB) 12th International Workshop on Future Aviation Activities (held in September 2002), the Vertical Flight Panel expressed the view that the active helicopter fleet is greater than the Survey estimates. The panel estimates that the active rotorcraft fleet totals between 10,500 and 11,900 in 2001, considerably higher than that suggested by the GA Survey. The TRB Helicopter Subcommittee, the FAA and others will continue to address the reconciliation of fleet numbers.

According to the 2001 GA Survey estimates, rotorcraft flew over 2.1 million hours in 2001, a decrease of 7.2 percent from 2000. Turbine rotorcraft hours (1.6 million), which account for approximately 73 percent of total rotorcraft hours, decreased 12.3 percent in 2001. Hours flown by piston rotorcraft totaled 582,606--an increase of 9.7 percent from 2000.

In 2001, the rotorcraft fleet flew an average of 315.7 hours per active aircraft—347.0 hours for turbine rotorcraft and 254.2 hours for piston rotorcraft. The data indicate a decrease in the average utilization of the helicopter fleet of 7.1 hours or 2.2 percent. Turbine rotorcraft utilization decreased 12.7 percent--down from 397.5 hours in 2000, while piston rotorcraft utilization increased 28.3 percent--up from 198.1 hours in 2000. The year-to-year fluctuations in these rates could be caused by the size and/or type of businesses of the helicopter owners/operators responding to the survey in any particular year.

FUEL CONSUMED

In 2001, fuel consumed by rotorcraft was estimated to be 54.4 million gallons, a decrease of 8.1 percent from the 2000 level of 59.2 million gallons. Jet fuel consumption declined 10.9 percent in 2001 while aviation gasoline consumption was up 10 percent. The overall decrease in fuel consumption by rotorcraft reflects the decreases in both the number of active rotorcraft and hours flown by those rotorcraft.

FUTURE ISSUES

Issues facing the rotorcraft industry include availability of infrastructure, improved safety image, price-to-performance ratio, the maturing of the offshore oil and air medical markets, and environmental impact. Expanding infrastructure faces both public and local government resistance because of safety and environmental concerns. Security restrictions imposed on general aviation and rotorcraft, in particular, has had an impact on the use of helicopters in news gathering and traffic reporting. Even with falling prices and improved operating performance, the demand for rotorcraft could be dampened by the lack of adequate landing facilities. Helicopters are seen as one option to transporting passengers or cargo from airports into the city or urban sites; however, operators often find themselves unable to convince communities that a heliport can be a good neighbor.

TECHNOLOGY

Technological advances could stimulate helicopter usage. The Global Positioning System (GPS) and other free flight enabling technologies offer the promise of freeing all aircraft, including helicopters, to use efficient direct routing to their destinations. These technologies may also enable helicopters to fly routes less noticeable to persons on the ground, increasing community acceptance

and further enhancing the utility of helicopter operations.

Another major technological advance is the civil tilt-rotor, which combines the vertical takeoff and landing capabilities of a helicopter with the speed and range of a turboprop aircraft. Other innovative rotorcraft configurations that have been discussed and may benefit from advanced (vertical) flight research include quad tilt rotor, ducted coaxial rotor, folding prop-rotor, and canard rotor/wing. Intelligent rotorcraft systems and efficient active rotor systems may also compete with the above revolutionary systems for research funding—from both NASA and the FAA.

MARKET FACTORS

Factors increasing the demand for helicopters include economic growth, the aging of the fleet, and the availability of new more efficient models. New models stimulate demand due to improvements in performance and cost of operation. Factors that may slow the demand for new products include lower levels of petroleum extraction in the United States (one of the primary use of helicopter services) at least in the short-term and limitations relating to supporting infrastructure.

According to the FAA/TRB Vertical Flight Panel, strong growth is expected in the next several years for the corporate/private fleet and the law enforcement fleets. The air medical market for helicopters is maturing. In the near-term, the air medical helicopter fleet is expected to decline in major metropolitan areas as hospital management becomes increasingly aware and concerned about the cost of their rotorcraft operations. However, this decline may be offset by growth in locations outside major cities.

The softness in oil prices during the late 1990's has had an impact on helicopter activity in the Gulf of Mexico. Based on data collected by the Helicopter Safety Advisory Conference (HSAC), the total helicopter fleet in the Gulf has fluctuated between 540 in 1996 and 581 in 2000, peaking at 636 in 1997.

Government regulation and harmonization initiatives may also influence market demand. Aviation regulations could enlarge or reduce the market for aircraft services, depending on whether particular regulations permit or prohibit operations for which a market demand exists. Harmonization is the process of reducing substantive differences between U.S. regulations and those of other nations. Harmonization of aircraft certification requirements helps open international markets to aircraft manufacturers located in participating nations.

A rapidly growing segment of general aviation is fractional ownership. Several companies have expressed interest in offering fractional ownership of helicopters. For a variety of reasons, including speed and operating range, fractional ownership of helicopters will need to be configured differently than it is for business jets. It is yet to be seen whether it can capture the attention of potential users, as the programs have in the corporate jet market.

HELICOPTER FORECASTS

The forecasts of the rotorcraft fleet and flight hours discussed in this section are presented in tabular form in Chapter X, Table 31. Many of the assumptions used to develop these forecasts were derived from discussions with industry experts—including consultants and association officials--and from reports presented at meetings of the TRB subcommittee on Civil Helicopter Aviation and the 12th FAA/TRB International Workshop.

The rotorcraft forecasts for active fleet, utilization, hours flown, and fuel consumed use data from the 2001 GA Survey as the base year. Therefore, the forecast period for these activity measures goes from 2001 through 2014. The average annual growth rates for the forecast period include 13 years (2001-2014). Certificated pilot forecasts are based on 2001 data from the airmen certification records kept at the FAA Aeronautical Center in Oklahoma City. For pilots, references to average annual growth rates include 12 years (2002-2014).

ACTIVE FLEET

The active rotorcraft fleet is expected to grow from 6,783 in 2001 to 7,390 in 2014, an average annual increase of about 0.7 percent in the active rotorcraft fleet over the 13-year forecast period.

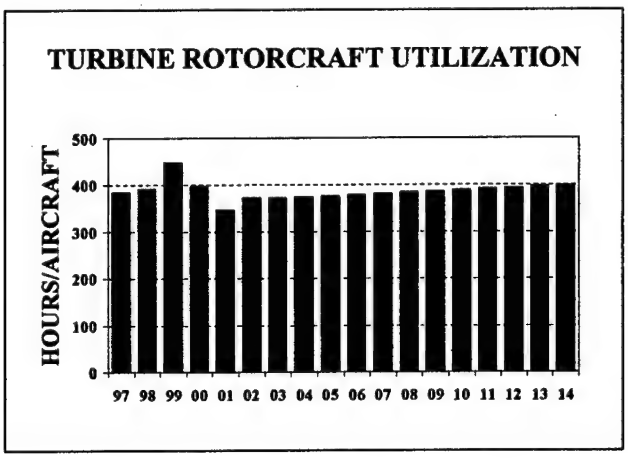
The number of turbine rotorcraft is forecast to total 4,590 by 2014--an increase of less than 100 rotorcraft over the 2001 level. The turbine rotorcraft fleet is expected to decrease by 3.1 percent in 2002, remain the same level in 2003, and then increase an average of 0.5 percent per year from 2004 to 2014. Turbine powered rotorcraft are expected to account for approximately 62.1 percent of the rotorcraft fleet in 2014, down from 66.2 percent in 2001.

The piston rotorcraft fleet is expected to increase 6.9 percent in 2002 and then grow approximately 1.0 percent per year for the rest of the forecast. The piston fleet totals 2,800 by 2014--an annual increase of 1.6 percent over the 13-year period.

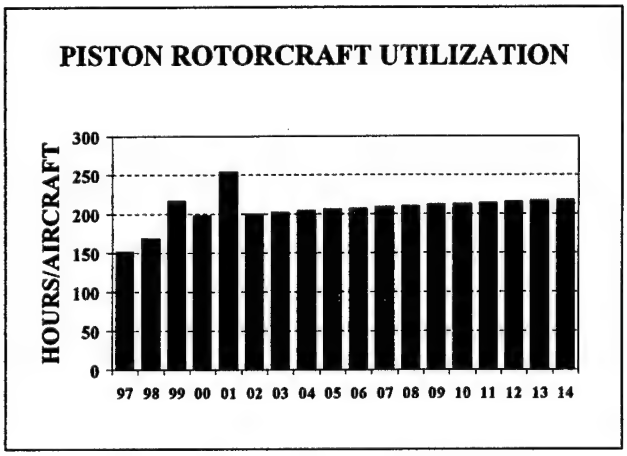
UTILIZATION

The annual utilization rate for all rotorcraft declined from 322.8 hours in 2000 to 315.7 hours in 2001, a decline of 2.2 percent. However, this relatively small decline conceals the fact that the piston utilization rate increased 28.4 percent while the turbine rotorcraft rate declined by 12.7 percent.[2] Both the piston and turbine rates diverge from past year estimates and are assumed to be one-year anomalies. As such, the 2000 utilization rates have been used as the base year for the forecasts and references to the average annual growth rates include 13 years (200-2014).

Utilization rates for all rotorcraft are expected to increase from 310.3 hours in 2002 to 330.9 in 2014, an annual increase of 0.6 percent. Turbine-powered helicopter utilization is forecast to increase by 0.6 percent annually, from 372.4 hours in 2002 to 399.8 hours in 2014.

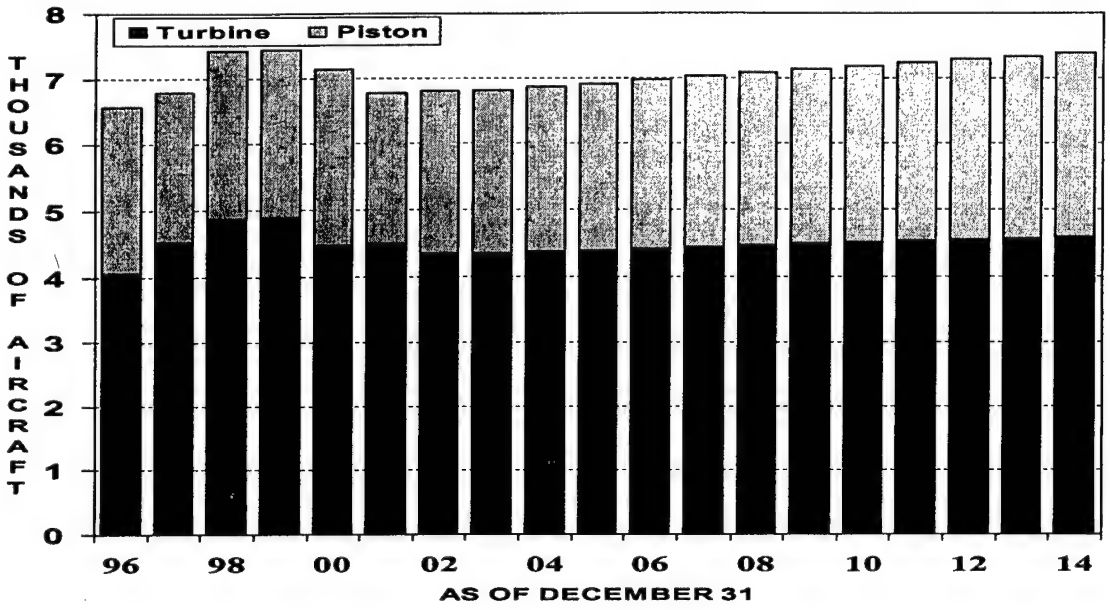


Piston-powered rotorcraft utilization increases 0.7 percent annually from 200 hours in 2002 to 217.9 hours in 2014.

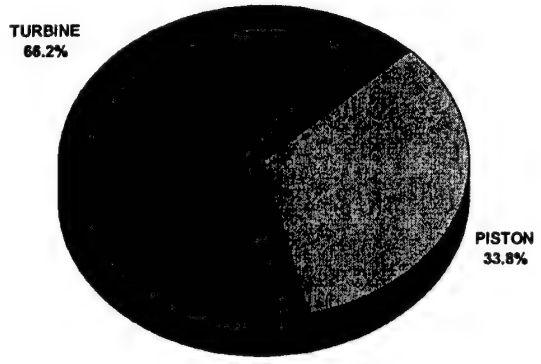


[2] The 2001 rotorcraft data may be considered a statistical anomaly. Therefore, the forecast assumes a return to levels shown prior to 2001.

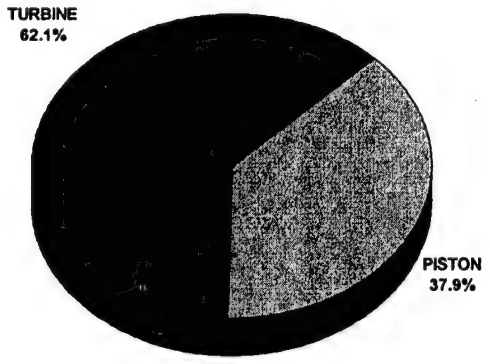
ACTIVE ROTORCRAFT



PERCENT BY AIRCRAFT TYPE

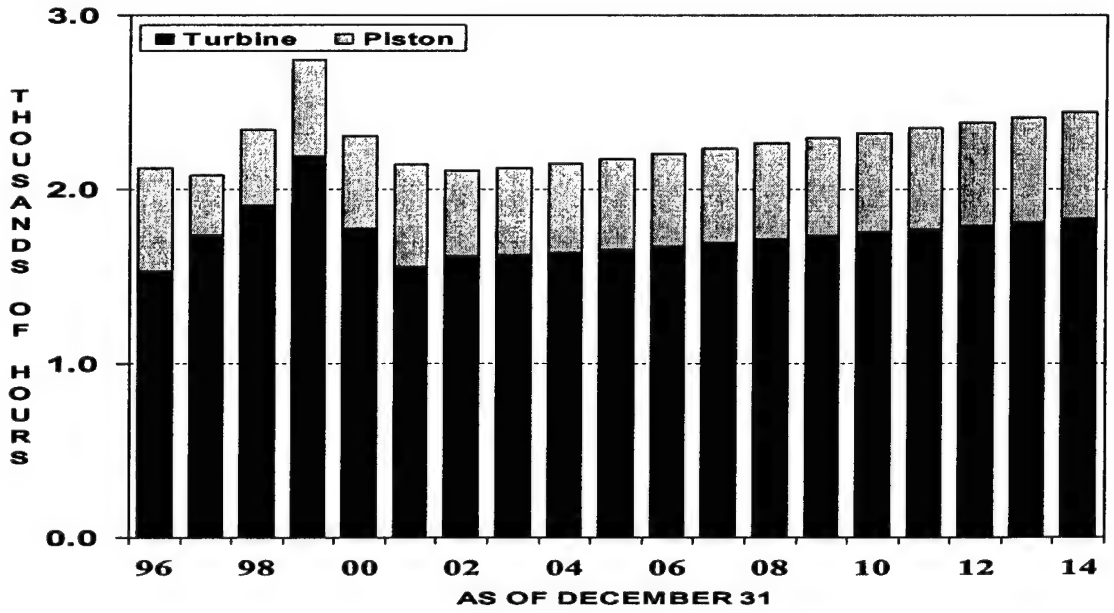


2001

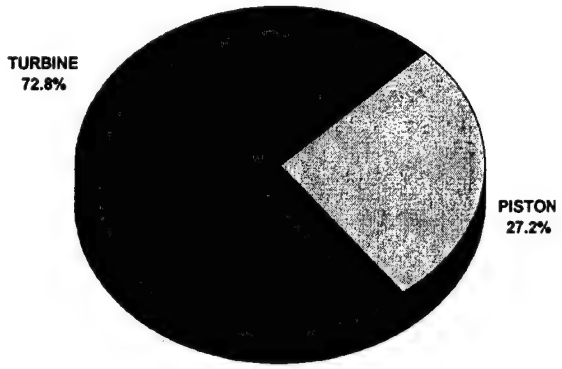


2014

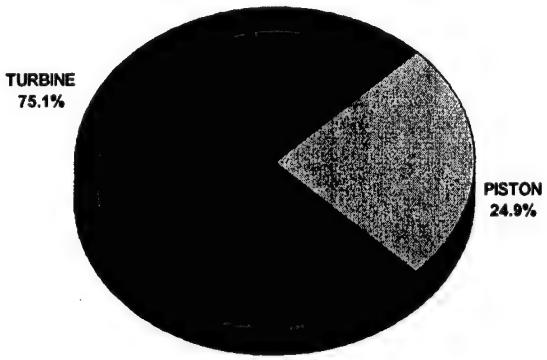
ROTORCRAFT HOURS FLOWN



PERCENT BY AIRCRAFT TYPE



2001



2014

FLIGHT HOURS

Total rotorcraft hours flown are forecast to increase from 2.1 million in 2002 to 2.4 million in 2014, an average annual increase of 1.2 percent. Total flight hours for turbine-powered rotorcraft are projected to increase by 1.0 percent annually, from 1.6 million in 2002 to 1.8 million in 2014. Flight hours for the piston powered portion of the rotorcraft fleet are expected to increase from 490,000 hours in 2002 to 610,000 hours in 2014, an average annual increase of 1.8 percent.

HELICOPTER PILOTS

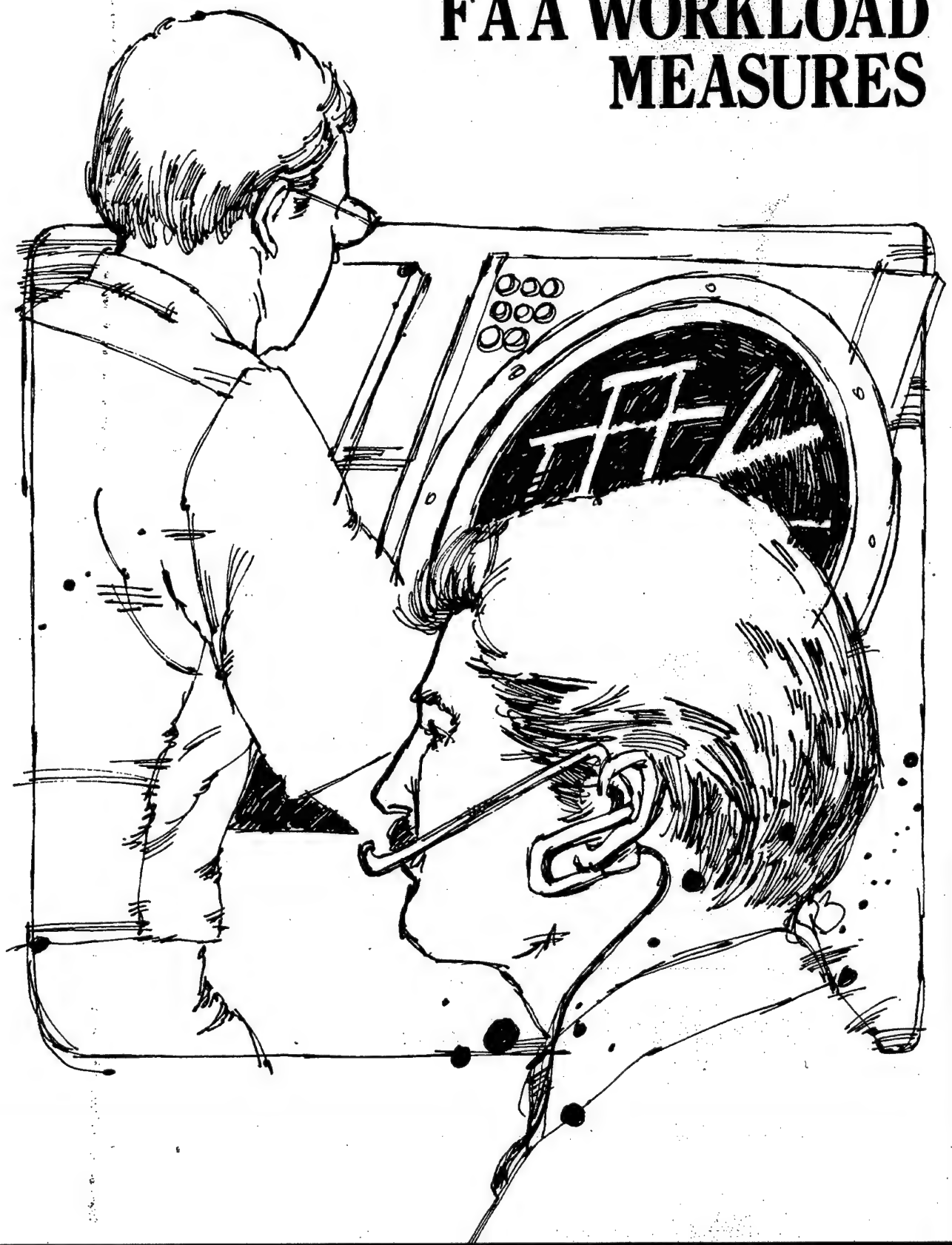
The number of rotorcraft only pilots is expected to increase at an annual rate of 0.8 percent over the 12-year period, rising from 7,770 in 2002 to 8,600 in 2015. This is below the 1.4 percent annual rate of increase expected for the overall pilot population and reflects the relatively slow growth projected for the rotorcraft fleet.

FUEL CONSUMED

In 2001, rotorcraft fuel consumption was estimated at 54.4 million gallons--8.8 million gallons by piston powered helicopters and 45.6 million gallons by turbine powered helicopters. Total fuel consumption by rotorcraft is projected to be 63.3 million gallons in 2014, 16.3 percent higher than the 2001 level. This represents an average annual growth of 1.2 percent during the forecast period. Fuel consumed by turbine-powered helicopters is forecast to be 54.1 million gallons by 2014, an average annual growth rate of 1.3 percent. Fuel consumed by piston-powered helicopters is expected to reach 9.2 million gallons by 2014, an average annual increase of 0.3 percent.

CHAPTER VII

FAA WORKLOAD MEASURES



CHAPTER VII

FAA WORKLOAD MEASURES

The FAA provides the aviation community with three distinct air traffic services: 1) air traffic control tower service at FAA and contract towered airports; 2) traffic surveillance and aircraft separation by air route traffic control centers (ARTCC); and 3) flight planning and pilot briefings at flight service stations (FSS). All four aviation system user groups--air carriers, commuter/air taxi, general aviation, and military--use these FAA operational services to enhance the flow and safety of aviation traffic.

Because the four aviation system user groups differ in the demands they impose on the air traffic system, multiple indicators are used to describe the total FAA operational workload. No single measure typifies past trends or future demand for the services provided by the FAA.

REVIEW OF 2002[1]

During 2002 the number of FAA towered airports remained unchanged at 266, while the number of contract towered airports increased by 11 to 217. Between 1990 and 2000, the number of FAA towered airports declined by 136, and the number of contract towered airports increased by 214. However, the number of FAA towers has remained constant at 266 since 2000 and is expected to remain at that number throughout the duration of the forecast.

The addition and/or removal of airports to/from FAA air traffic counts make comparisons to previous year's activity levels difficult, if not impossible. To overcome these discontinuities, the FAA reports air traffic activity at FAA and contract tower facilities on both an individual as well as a combined basis. Activity at FAA air route traffic control centers is not affected by the tower conversions.

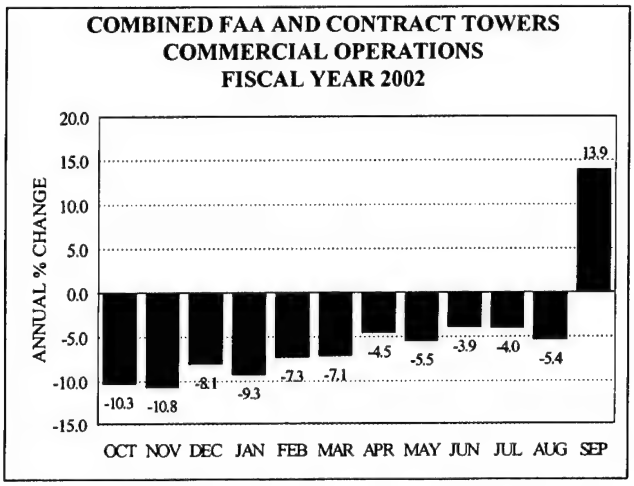
TOWER ACTIVITY

Combined FAA and Contract Towers

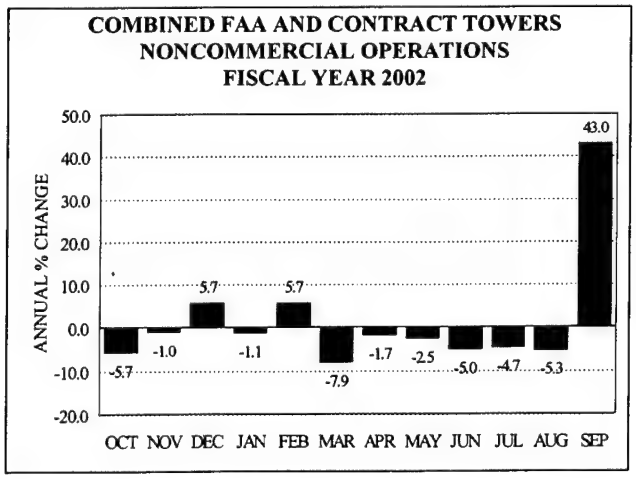
Aircraft activity at the 483 FAA and contract towered airports totaled 64.9 million operations, down 2.0 percent from 2001. In 2002, commercial activity decreased 5.5 percent with every month below 2001 levels except for

[1] All specified years are fiscal years (October through September 30), unless designated otherwise.

September when the closing of U.S. airspace following the terrorist attacks of September 11th depressed prior year activity. Air carrier operations driven by declining traffic and schedule reductions following the events of September 11th were down 10.5 percent.



Operations by commuter/air taxi increased by 1.3 percent in 2002, to 11.0 million. Much of the growth was the result of the transfer of lower density, short-haul markets to commuters, especially the regional jet operators. In addition, growth in recent years has been stimulated by commuter code-sharing and schedule tie-in agreements with the larger commercial air carriers.



Noncommercial activity (the sum of general aviation and military operations) increased 0.2 percent in 2002 driven by an increase in military aviation activity. Noncommercial activity in September was up 43 percent year over year, reflecting the depressed activity following the September 11th terror attacks. General aviation operations were down 0.2 percent for the year with itinerant operations down 0.1 percent and local operations down 0.3 percent. Military activity was up 5.0 percent with itinerant operations up 4.9 percent and local activity up 5.1 percent.

FAA Towers

On September 30, 2002, there were 266 FAA towered airports. Aircraft operations at these airports totaled 48.5 million, down 4.2 percent from 2001. Of the four users of the system, commuter/air taxi and military operations increased during the year, up 1.8 and 0.7 percent, respectively. The other users of the system, air carrier and general aviation were down 10.6 and 3.0 percent, respectively.

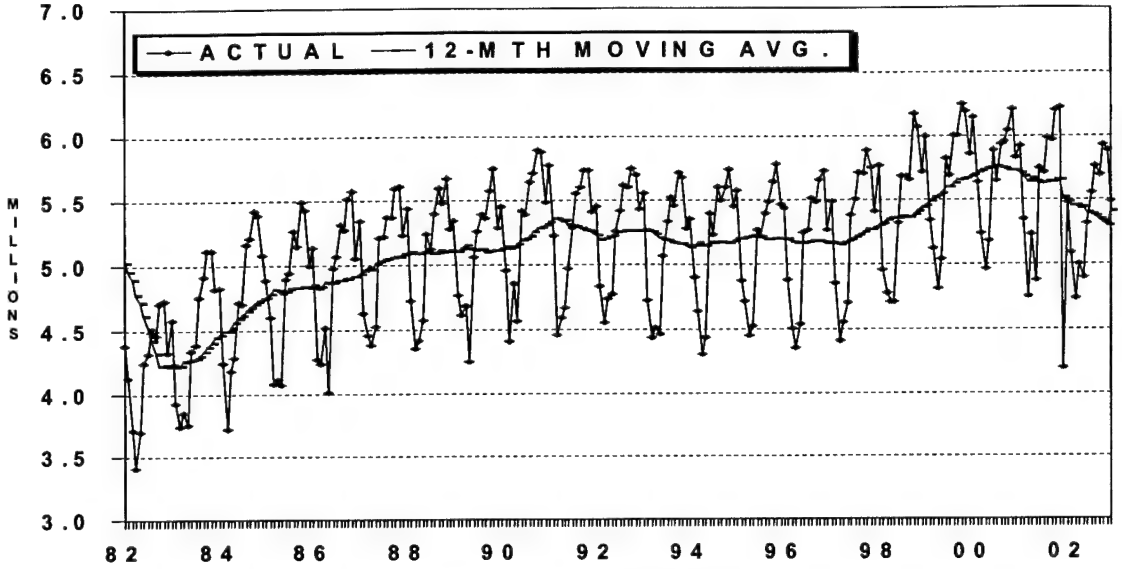
Contract Towers

On September 30, 2002, there were 217 contract towers funded either partially of fully by the FAA. Aircraft activity totaled 16.4 million operations, up 5.1 percent from 2001. Commercial activity decreased 1.9 percent, while noncommercial activity rose 6.0 percent. In 2001 air carrier activity decreased 8.1 percent, while commuter/air taxi operations fell 1.1 percent. General aviation operations increased by 5.4 percent while military operations jumped 14.3 percent. General aviation continues to dominate activity at FAA contract towers, accounting for 82.8 percent of total operations.

Monthly operation counts for the 266 FAA towered airports and the 217 contract towers, by user group, can be found on the internet at: http://www.apo.data.faa.gov/.

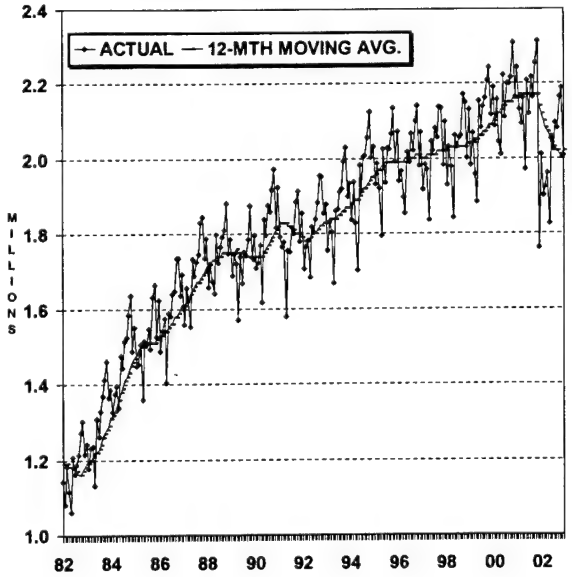
COMBINED FAA AND CONTRACT TOWERS: AIRPORT OPERATIONS

TOTAL OPERATIONS



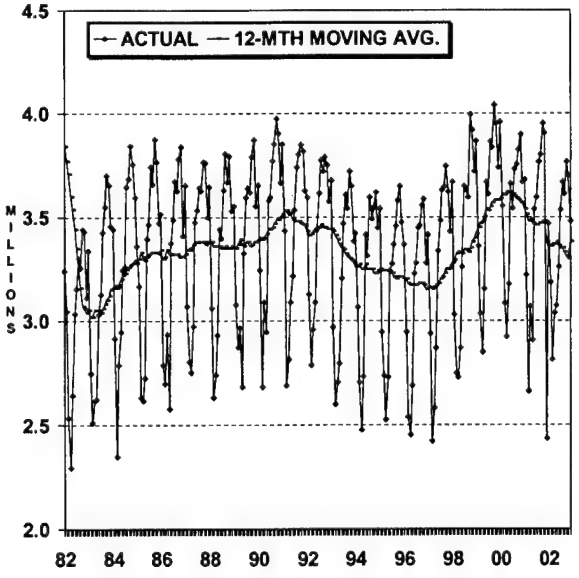
FISCAL YEAR BY MONTH

COMMERCIAL OPERATIONS



FISCAL YEAR BY MONTH

NONCOMMERCIAL OPERATIONS

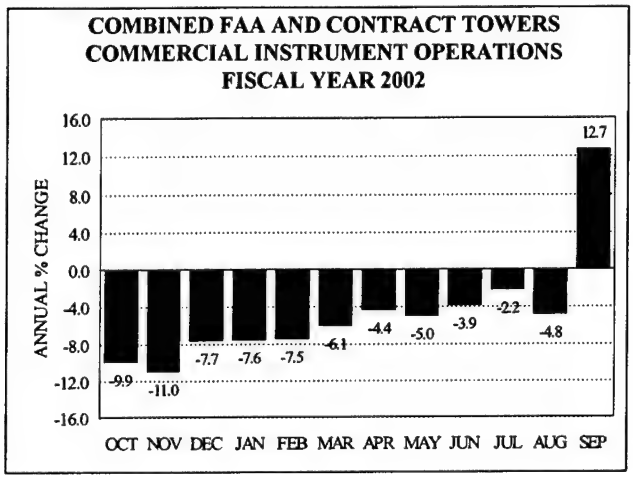


FISCAL YEAR BY MONTH

INSTRUMENT OPERATIONS

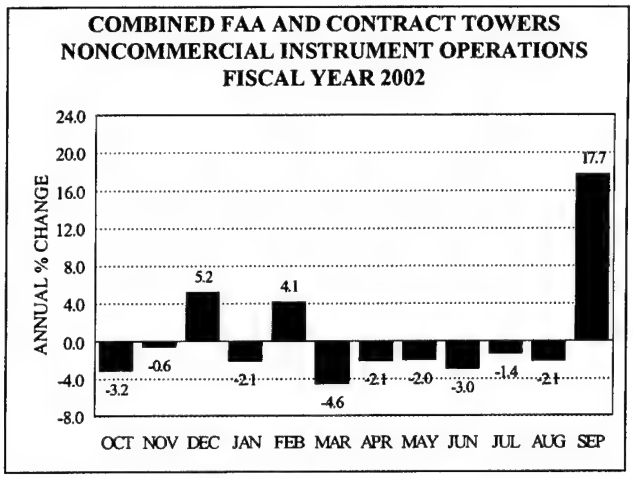
Combined FAA and Contract Towers

Instrument operations handled at combined FAA and contract towers totaled 49.6 million, down 2.7 percent from the 2001 activity level. In 2002, FAA towers accounted for 98.4 percent of combined total instrument operations.



Commercial instrument operations decreased 5.0 percent with monthly levels below 2001 levels until September when the closing of U.S. airspace following the terrorist attacks of September 11th depressed prior year activity. Air carrier activity was down 10.0 percent for the year, while commuter/air taxi instrument operations increased 1.7 percent.

Noncommercial instrument operations remained flat at 23.2 million. The large year over year increase in September activity reflected the impact on prior year levels of the September 11th attacks on activity. General aviation operations fell slightly, down 0.3 percent for the year, but still accounted for almost 40 percent of total instrument operations. Military operations increased 1.7 percent, and accounted for only 7.2 percent of the total.



FAA Towers

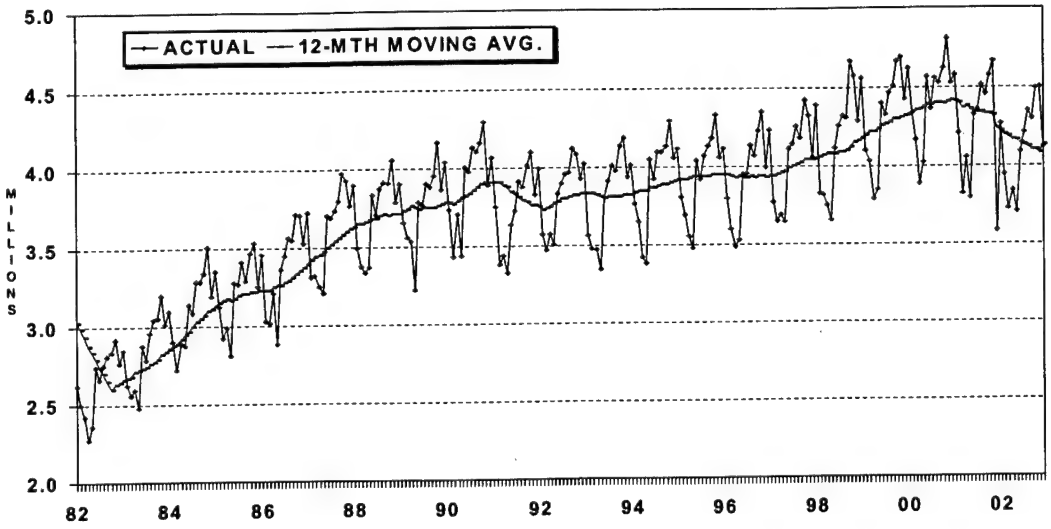
Instrument operations at the 266 FAA towered airports totaled 48.7 million, a decrease of 2.7 percent. Commercial activity was down 5.0 percent, while noncommercial operations remained flat. In 2002, air carrier and general aviation instrument operations both decreased, down 10.1 and 0.2 percent, respectively. Commuter/air taxi activity was up 2.0 percent, while military activity increased 1.8 percent.

Contract Towers

Instrument operations at FAA contract towered airports totaled 811,800, down 3.3 percent from 2001. Commercial activity decreased 5.2 percent, while noncommercial activity dropped 0.3 percent. In 2002, air carrier instrument operations at FAA contract towers decreased 1.0 percent, while commuter/air taxi dropped the largest of any sector, falling 6.6 percent. General aviation instrument operations recorded the only increase in activity, up 0.4 percent while military operations decreased by 3.3 percent.

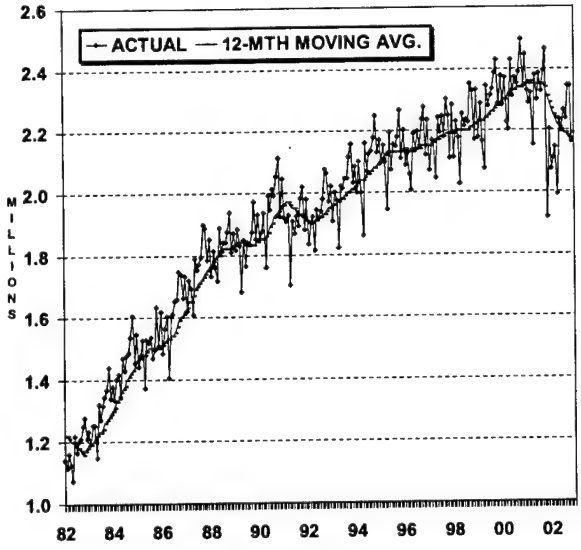
COMBINED FAA AND CONTRACT TOWERS: INSTRUMENT OPERATIONS

TOTAL OPERATIONS



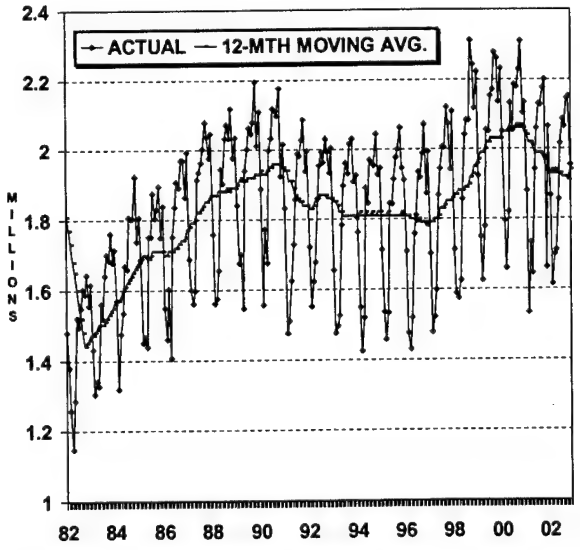
FISCAL YEAR BY MONTH

COMMERCIAL OPERATIONS



FISCAL YEAR BY MONTH

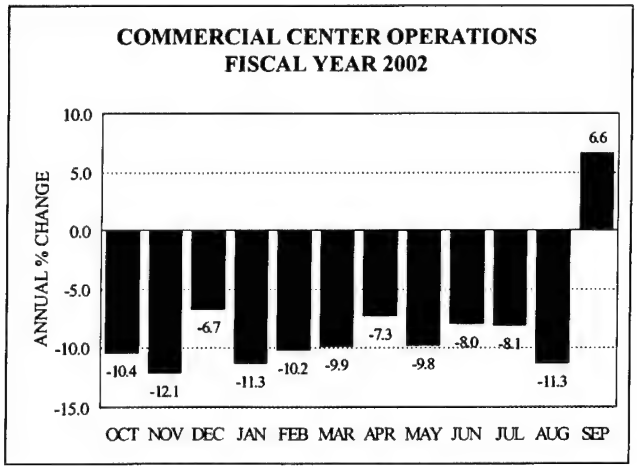
NONCOMMERCIAL OPERATIONS



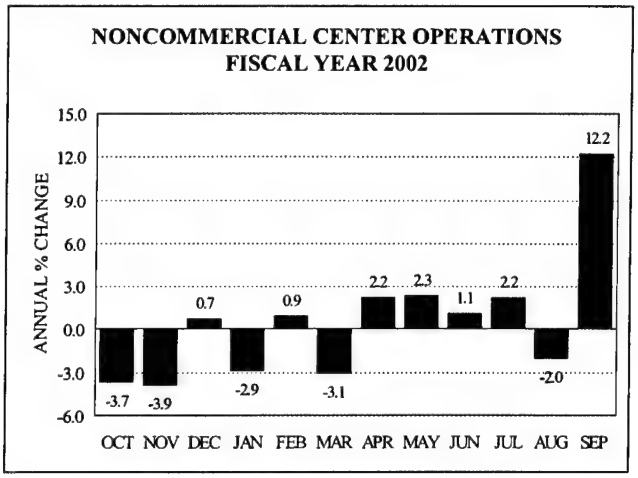
FISCAL YEAR BY MONTH

CENTER ACTIVITY

In 2002, the number of aircraft flying under Instrument Flight Rules (IFR) handled by FAA ARTCCs totaled 43.7 million, a decrease of 3.3 percent from the 2001 activity counts. The number of commercial aircraft handled at the Centers (31.6 million) fell 4.6 percent in 2002 with September the only month showing year over year gains (prior year totals were impacted by the shutdown of U.S. airspace following the September 11th attacks). The number of air carrier aircraft handled totaled 22.8 million (down 8.2 percent), while the number of commuter/air taxi aircraft handled totaled 8.8 million (up 6.1 percent).



The number of noncommercial aircraft handled (12.1 million) rose 0.3 percent. After being down in the early part of the year, year over year changes in noncommercial aircraft turned positive during the later half of the year culminating in September's 12.2 percent increase (driven primarily by depressed prior year levels following the September 11th attacks). The number of general aviation aircraft handled totaled 8.2 million (up 1.9 percent), while military activity totaled 3.9 million (down 2.9 percent).



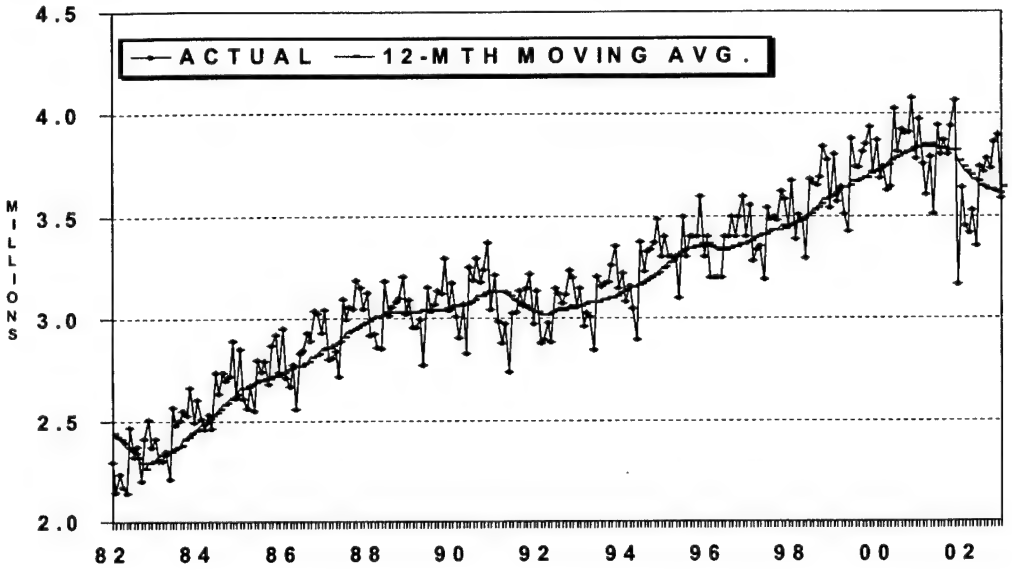
FLIGHT SERVICE STATION ACTIVITY

Total flight services, encompassing pilot briefings, flight plans filed, and aircraft contacts recorded by FAA Flight Service Stations (FSS) totaled 29.4 million in 2002, up 0.4 percent from 2001 activity levels. In 2002, the number of aircraft contacted rose 0.3 percent to 2.97 million, the number of pilot briefings rose by 0.5 percent to 7.46 million, and the number of flight plans originated increased 0.4 percent to 5.77 million.

The FAA also provides automated flight services, which supplement FSS activity. The Direct User Access Terminal System (DUATS) provides an alternative to the FSS for obtaining pilot briefing information and filing flight plans. Use of this service was introduced in February 1990.

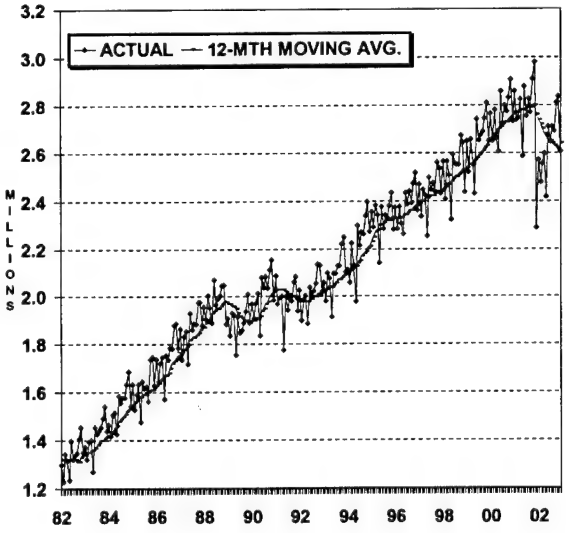
FAA AIR ROUTE TRAFFIC CONTROL CENTERS: IFR AIRCRAFT HANDLED

TOTAL AIRCRAFT HANDLED



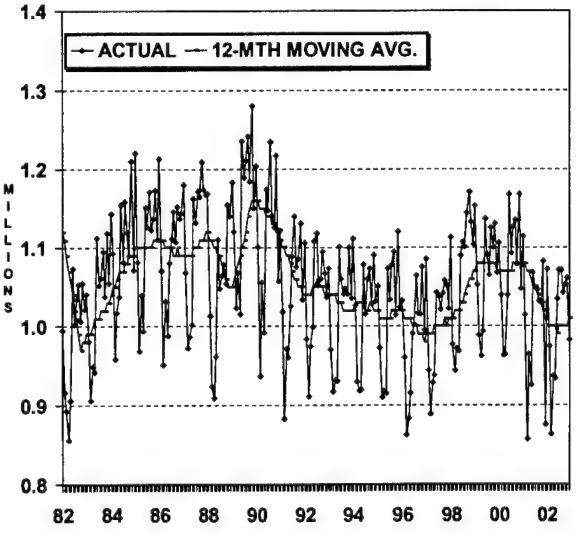
FISCAL YEAR BY MONTH

COMMERCIAL OPERATIONS

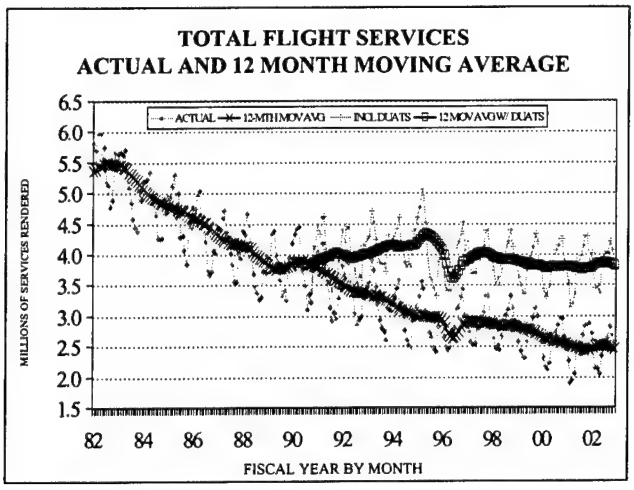


FISCAL YEAR BY MONTH

NONCOMMERCIAL OPERATIONS



FISCAL YEAR BY MONTH



In 2002, total DUATS transactions (including flight plans) totaled 16.5 million, an increase of 3.4 percent over 2001. The number of flight plans filed through DUATS shot up 48.4 percent to 1.2 million. The number of DUAT transactions (excluding flight plans) decreased 1.5 percent in 2002, from 7.2 million in 2001 to 7.1 million.

When these DUAT services are included with traditional FSS services, total flight services grew from 45.2 million in 2001 to 45.9 million in 2002, an increase of 1.5 percent.

FORECAST ASSUMPTIONS

Forecast growth in FAA workload measures includes not only the demand imposed on the existing National Airspace System, but also aviation activity at new locations not previously provided with FAA services. Workload forecasts are presented for combined FAA and contract towers, and separately for FAA facilities and contract towers.

NUMBER OF FAA FACILITIES

There were 266 FAA towered airports on September 30, 2002. There are 150 radar service areas--48 terminal radar service areas, 16 class B (terminal control areas), and 86 class C (airport radar service areas). The number of FSSs and AFSSs totaled 75 on September 30, 2002: 61 AFSSs and 14 Alaskan rotational FSSs.

In 2003, the number of contract tower airports will increase from 217 to 224 and are assumed to remain at that level over the remainder of the forecast period. The number of FAA towers is assumed to remain at 266 throughout the forecast period.

COMMERCIAL AVIATION: RISKS AND UNCERTAINTIES

Although growth in demand for commercial aviation services is based upon continued growth in the U. S. economy, lower industry operating costs, lower fares, lower fuel costs, and financial stability, there is uncertainty associated with these forecasts. A number of events could alter the short- and long-term environment, and cause demand to differ substantially from the projections presented in this report. Also, structural changes in the industry could change the mix of operations at FAA facilities.

The events of September 11th have had a significant impact on the demand for aviation services. A modest rebound from the lows in 2002 is forecast beginning in 2003 and then a return to long term trends is assumed beginning in 2005. Increased demand is initially met by utilizing the existing fleet more intensively and by achieving higher load factors. Ultimately the increase in demand leads to increases in aviation activity.

The introduction of state-of-the-art jet aircraft into the regional/commuter fleet coupled with the financial aftermath of September 11th is significantly altering the route system of the industry. These new aircraft are greatly expanding the number of markets that regional/commuters can serve. Should the number of route transfers or new markets greatly exceed current expectations, commuter/air tax operations at FAA facilities could be higher than currently forecast. Conversely, air carrier operations would be lower.

Further, with the financial condition of the U.S. airline industry in such poor shape, it is conceivable that one or more of the existing carriers will not survive. If the structure of the industry were to change as a result of a failure of a major carrier, it is likely that operations at some FAA facilities would be greatly impacted.

WORKLOAD FORECASTS

METHODOLOGY

The workload measures for airports with air traffic control towers are the number aircraft operations (sum of landings and takeoffs) and instrument operations. The workload measure for ARTCCs is the number of aircraft handled (sum of departures, landings, and overflights for aircraft operating under instrument flight rules). For flight service stations, the workload measures are flight plans filed, pilot briefings, and aircraft contacts. The workload measures are developed by user category for all three components of the air traffic control system.

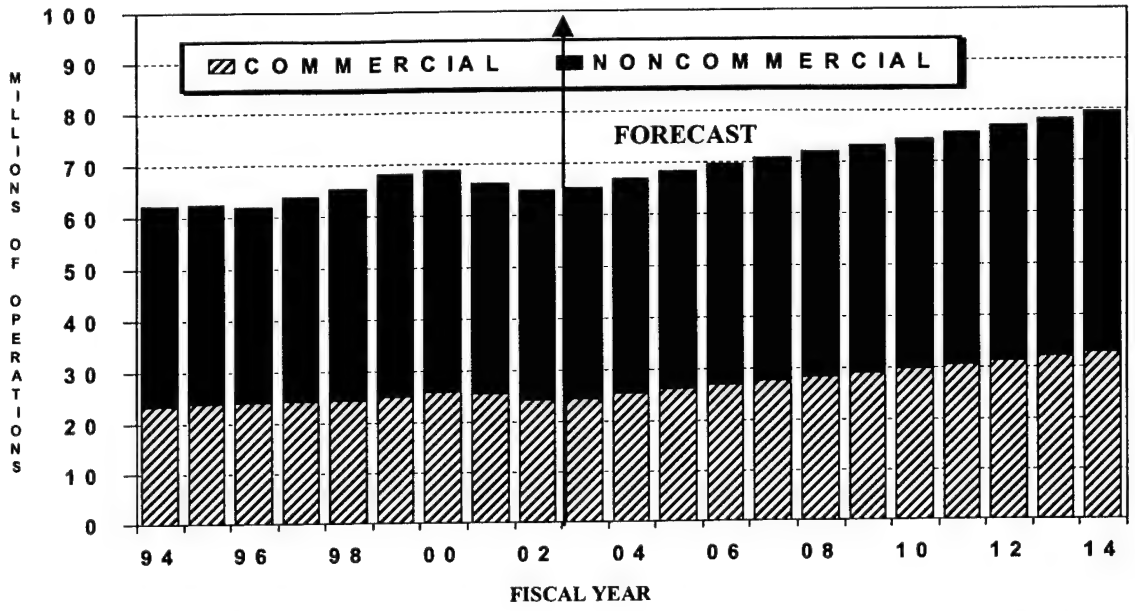
Projections of total operations for commercial air carriers and commuter/air taxis at airports with air traffic control towers are based upon forecasts of Available Seat Miles (ASMs), and assumptions regarding average seats per aircraft, and aircraft stage length. Specifically, if the average number of seats per aircraft is divided into the forecast of ASMs, an estimate of the number of aircraft miles in the system is derived. The average aircraft stage length is then divided into the forecast of aircraft miles in order to derive an estimate for departures. For both air carriers and cargo operators, estimates are made for both international and domestic departures. An estimate of total operations for the air carrier and commuter/air taxis is derived by doubling the number of departures. Forecasts of general aviation airport operations are developed from projections of general aviation hours flown and the general aviation fleet.

Forecasts of instrument operations for airports with air traffic control towers, and the workload measures for ARTCCs and flight service stations are derived from the forecasts of airport operations by user category. Military operations were assumed to remain at current levels throughout the forecast period.

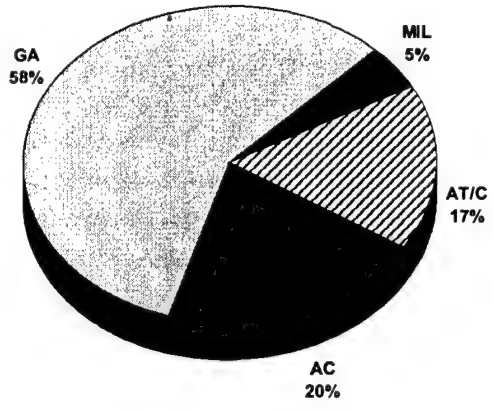
TOWER ACTIVITY

It is assumed that the number of FAA control towers will remain constant at 266 throughout the forecast period. The number of contract towers is expected to increase by seven to 224 in 2003 and remain at that level for the duration of the forecast. It is assumed that the seven new towers will be phased in throughout 2003. As such, the addition of the new towers will impact contract tower operations in both 2003 and 2004.

AIRCRAFT OPERATIONS AT AIRPORTS WITH FAA AND CONTRACT TRAFFIC CONTROL SERVICE



DISTRIBUTION OF WORKLOAD BY USER GROUP



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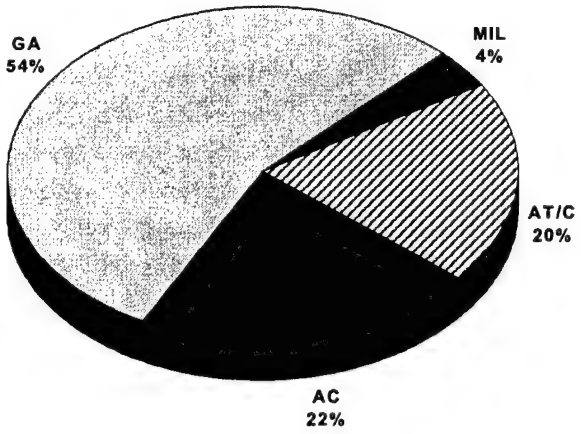


2014

Combined FAA and Contract Towers

During the 12-year forecast period, operations at FAA and contract towered airports grow to 79.1 million by 2014, increasing 1.7 percent annually on average. Growth in tower activity in 2003 is projected to be flat with a decline in air carrier operations (down 2.0 percent) offset by a modest increase in the commuter/air taxi activity (up 2.5 percent). As the demand for aviation services recovers slowly, so does the level of activity. For the balance of the forecast from 2004 to 2014, tower activity is projected to increase an average of 1.7 percent per year. Commercial activity is forecast to grow at relatively faster rates than general aviation. Air carrier operations share of the combined towered airport activity increases slightly from 20.4 percent in 2002 to 21.7 percent in 2014. The commuter/air taxi share increases significantly from 17.0 percent in 2002 to 19.3 percent by 2014. The general aviation share of activity declines from 57.9 percent in 2002 to 55.1 percent by 2014. Commuter/air taxi activity is projected to grow at rates faster than that forecast for the larger commercial air carriers with accelerating route transfers and increased use of regional jets the primary drivers.

In 2002, air carrier operations declined from 14.8 to 13.2 million operations, a 10.5 percent decrease. Although the demand for commercial air travel begins to recover in 2003, air carrier operations decrease 2.0 percent and then grow at a modest rate (2.5 percent annually) for the remainder of the forecast period. However, air carrier operations do not return to the 2000 level of activity until 2010. For the entire 12-year forecast period, air carrier operations increase at a rate of 2.2 percent annually.

Commuter/air taxi activity grows an average of 4.0 percent per year between 2003 and 2005, then increases at a 2.4 percent annual rate over the remainder of the forecast. Over the 12-year forecast period, commuter/air taxi operations grow an average of 2.8 percent annually, increasing from 11.0 to 15.3 million operations. General aviation remains flat in 2003, then increases 2.1 percent in 2004, primarily due to a full year of operations at the new contract towers. For the remainder of the forecast, general aviation operations increase at a rate of 1.3 percent per year. For the entire forecast period, general aviation operations increase from 37.6 to 43.6 million operations (1.3 percent annual growth). Itinerant general aviation operations are forecast to increase 16.5 percent over the period, and local general aviation operations are projected to increase 15.6 percent over the period. Total military operations are projected to increase to 3.1 million by 2004 then remain at that level throughout the balance of the forecast period.

Commercial aircraft activity at combined towered airports remains flat in 2003, as the decline in air carrier activity is offset by an increase in commuter/air taxi activity. By 2005, commercial aircraft activity returns to the level of activity in 2000, the worst year on record for delays. Should activity increases occur without an increase in system capacity, significant congestion problems may result.

However, the mix of traffic will be significantly different than existed in 2000. In 2000, air carrier operations accounted for 58.5 percent of total commercial operations. By 2005, it is expected that the air carrier share of commercial operations will decline to 52.9 percent. The surge in regional jet activity adds to the complexity of the FAA workload. Regional jets need more separation then do the large jets operated by the air carriers, and the regional jets fly at the same altitudes as do larger jets, increasing congestion at the higher altitudes. In certain large hubs, such as Chicago O'Hare, the change in the mix of commercial operations is expected to be even greater. For the period 2005 to 2014, commercial activity increases at an average rate of 2.5 percent per year.

Commercial activity growth averages 2.5 percent annually during the 12-year forecast period, increasing from 24.2 to 32.4 million. Noncommercial activity increases at an average of 1.2 percent annually, from 40.6 million in 2002 to 46.7 million in 2014.

Forecasts for individual airports are contained in the FAA's Terminal Area Forecast and are available at the following website: http://www.apo.data.faa.gov/.

FAA Towers

In 2002, operations at the 266 FAA towered airports totaled 48.5 million, down 4.1 percent from 2001. For the 12-year forecast period, operations at FAA towered airports increase 1.7 percent a year. In absolute numbers, towered operations total 59.4 million in 2014.

Commercial aircraft activity at FAA towered airports is projected to grow 2.4 percent annually during the 12-year forecast period, from 22.5 to 30.0 million, exceeding the level of activity that occurred in 2000 by 2006. Noncommercial activity increases from its current level of 26.1 million to 29.4 million in 2014 (1.0 percent annually), and does not exceed the 2000 level of activity until 2013.

Contract Towers

In 2002, operations at the 217 contract towered airports totaled 16.3 million, a 4.9 percent increase from 2001. The forecast assumes that seven new contract towers are added in 2003. The vast majority of the increased activity at these towers is general aviation and military activity. During the 12-year forecast period, operations at contract towered airports increase at an annual rate of 1.6 percent, totaling 19.7 million in 2014. The additional activity of the new towers provides for modest growth in contract tower operations in 2003 (1.9 percent) followed by a year of higher growth (3.6 percent). Thereafter growth in contract tower activity will moderate.

Commercial aircraft activity at contract towered airports grows an average of 2.7 percent annually during the 12-year forecast period, increasing from 1.8 million to 2.4 million. Noncommercial activity grows slower, averaging 1.4 percent annually, increasing from 14.6 million in 2002 to 17.3 million in 2014.

INSTRUMENT OPERATIONS

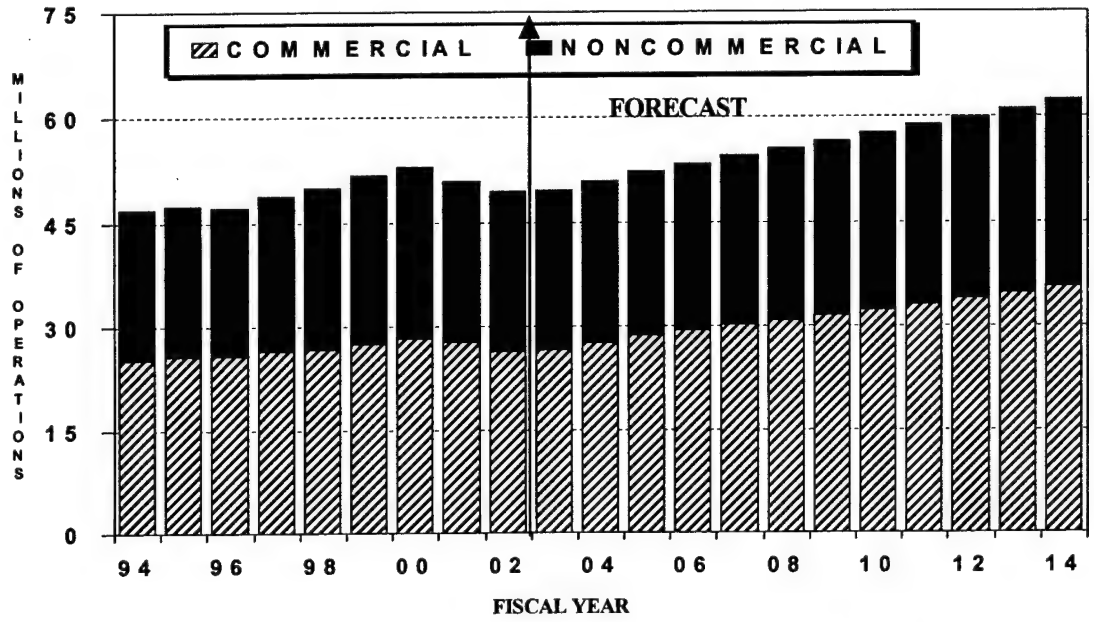
Combined FAA and Contract Towers

During the forecast period, combined instrument operations increase from 49.6 million operations in 2002 to 61.9 million operations in 2014, averaging 1.9 percent annually. In 2014, FAA towers will account for about 98.3 percent of combined instrument operations.

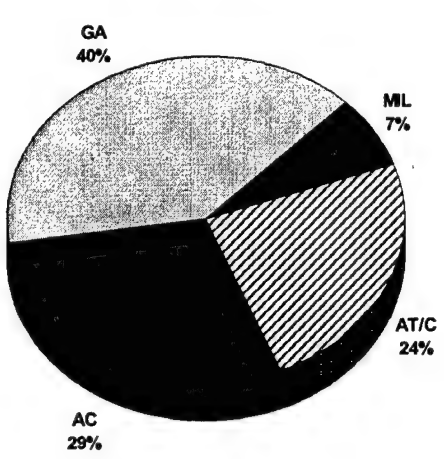
The mix of instrument operations is expected to change during the forecast period. While the air carrier share of total instrument operations increases about 1 point over the forecast period (from 29.0 to 30.1 percent), the commuter/air taxi share increases significantly from 24.1 percent in 2002 to 26.7 percent. General aviation's share declines from 39.7 percent to 37.3 percent over the 12-year forecast period.

Air carrier instrument operations are forecast to decrease 2.0 percent in 2003, then increase 3.3 percent in 2004 and grow 2.5 percent annually thereafter. During the entire 12-year forecast period, air carrier instrument operations increase 2.2 percent annually from 14.4 million

INSTRUMENT OPERATIONS AT AIRPORTS WITH FAA AND CONTRACT TRAFFIC CONTROL SERVICE



DISTRIBUTION OF WORKLOAD BY USER GROUP



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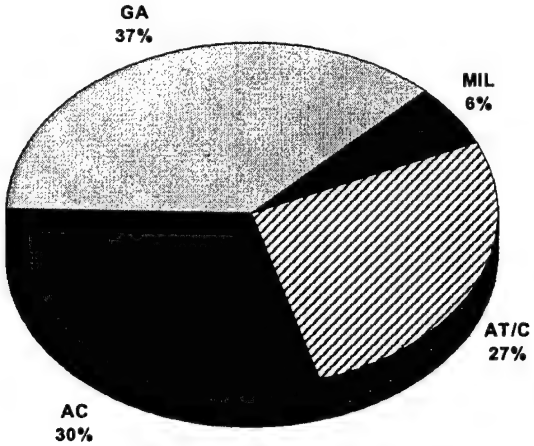


2014

to 18.7 million by 2014. Commuter/air taxi operations increase 3.5 percent per year through 2005, then grow 2.4 percent per year thereafter. For the 12-year forecast period, commuter/air taxi operations grow 2.8 percent annually, increasing from 11.9 million to 16.6 million.

General aviation operations fall 1.1 percent in 2003 then increase steadily thereafter and grow an average of 1.4 percent annually during the forecast period, increasing from 19.6 million to 23.1 million operations. Military activity increased 1.8 percent in 2002 to 3.6 million, and remains at that level for the balance of the forecast.

During the 12-year forecast period, commercial activity increases 2.5 percent annually, from 26.3 million to 35.2 million. Noncommercial activity is forecast to increase 1.2 percent annually, from 23.2 million in 2002 to 26.7 million in 2014.

FAA Towers

Instrument operations at FAA towered airports are projected to decrease 0.4 percent in 2003 as declines in air carrier and general aviation operations offset an increase in commuter/air taxi operations. For the 12-year forecast period, instrument operations at FAA towered airports increase at an average annual rate of 1.9 percent. In absolute numbers, FAA towered instrument operations reach 60.9 million in 2014.

Commercial instrument operations at FAA towered airports remain unchanged in 2003 then increase 3.6 percent in 2004 mirroring the rebound in demand for commercial air transport. During the period 2005 to 2014, commercial instrument operations at FAA towered airports grow 2.5 percent annually. For the entire 12-year forecast period, commercial instrument operations increase from 26.1 million to 34.6 million, a rate of 2.5 percent annually. Noncommercial activity expands 1.2 percent annually, from 22.9 million in 2002 to 26.3 million in 2014.

Contract Towers

For the 12-year forecast period, instrument operations at contract towered airports increase 2.0 percent a year, totaling 1.03 million in 2014.

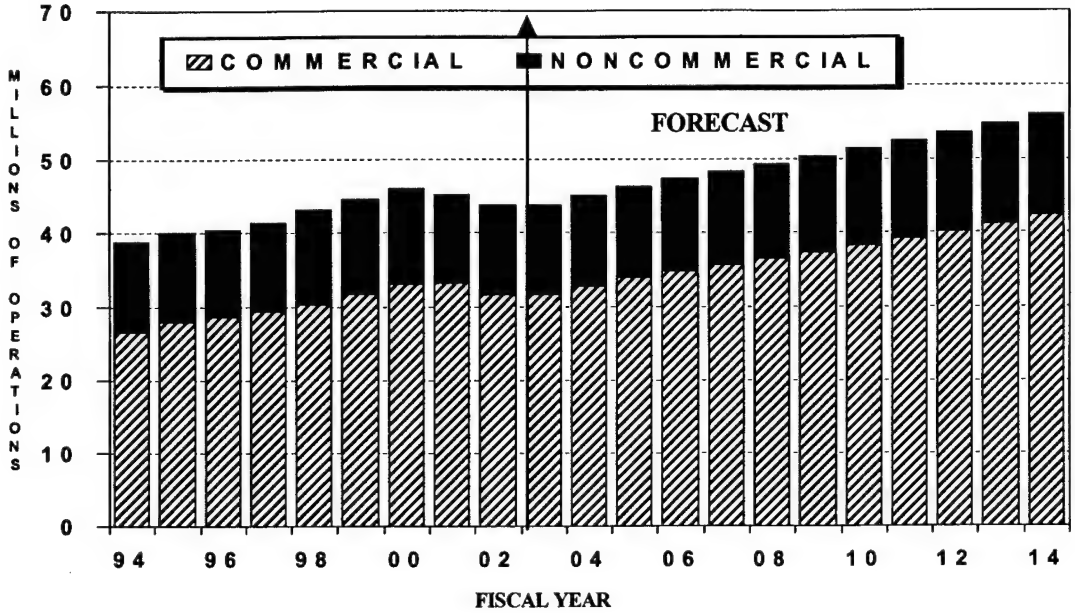
Commercial instrument operations at contract towered airports grow at an average annual rate of 2.6 percent during the 12-year forecast period, increasing from 477,500 to 651,100. Noncommercial activity is forecast to increase from 336,400 in 2002 to 380,300 in 2014, growing at an average annual rate of 1.0 percent.

CENTER ACTIVITY

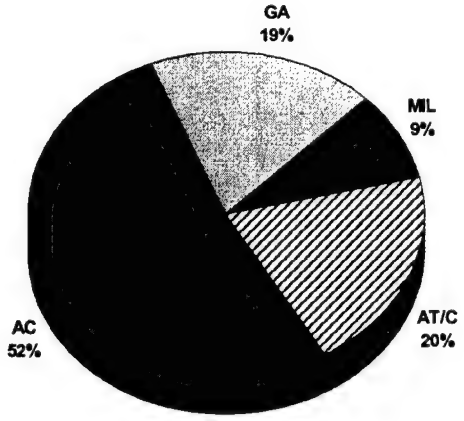
During the 12-year forecast period, the number of aircraft handled at centers increases 2.0 percent annually, expanding from 43.7 million aircraft handled in 2002 to 55.6 million in 2014. Aircraft handled fall 0.3 percent in 2003 as increases in commuter/air taxi and general aviation aircraft are offset by a decline in air carrier activity. Following a 2.9 percent increase in 2004, growth in aircraft handled averages 2.1 percent during the period 2005 to 2014.

The number of air carrier aircraft handled at centers is forecast to increase from 22.8 million in 2002 to 29.6 million in 2014, a 2.2 percent annual growth rate. Air carrier aircraft handled fall 2.1 percent in 2003, increase 3.3 percent in 2004, and then grow at an average rate of 2.5 percent per year between 2005 and 2014.

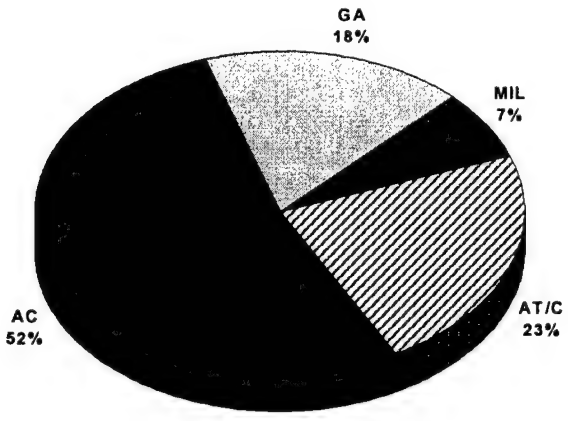
IFR AIRCRAFT HANDLED AT FAA AIR ROUTE TRAFFIC CONTROL CENTERS



DISTRIBUTION OF WORKLOAD BY USER GROUP



2002



2014

Commuter/air taxi aircraft handled is expected to increase by 3.7 percent per year through 2005 and grow 2.8 percent annually for the 12-year forecast period, increasing from 8.8 million to 12.3 million. The relatively strong growth during the first 3 years of the forecast period reflects increases in the commuter stage length during this period.

General aviation aircraft handled increases 1.0 percent in 2003 and continues to increase steadily to total 9.8 million in 2014 (1.6 percent annual growth). Military activity decreased 2.9 percent in 2002 to 3.9 million and remains at that level throughout the forecast period.

Commercial activity grows at an average annual rate of 2.4 percent during the forecast period, increasing from 31.6 million to 41.9 million. Noncommercial activity increases 1.1 percent annually, increasing from 12.1 million in 2002 to 13.8 million in 2014.

The commercial aircraft activities' share of center workload is forecast to increase from 72.3 percent in 2002 to 75.3 percent in 2014. Between 2002 and the year 2014, the air carrier share is forecast to increase from 52.2 to 53.2 percent, while the commuter/air taxi share increases from 20.1 to 22.1 percent.

FLIGHT SERVICE STATION ACTIVITY

The introduction of new technology for flight service applications has significantly changed the operating environment of the flight service system. Viewed in the larger context of the total National Airspace System, the recent declining trend in non-automated flight services do not necessarily indicate declining demand for total flight planning services. Rather, they may indicate that demand is being met through increased use of automation and new system capabilities resulting in increased efficiency and productivity.

Non-automated Service

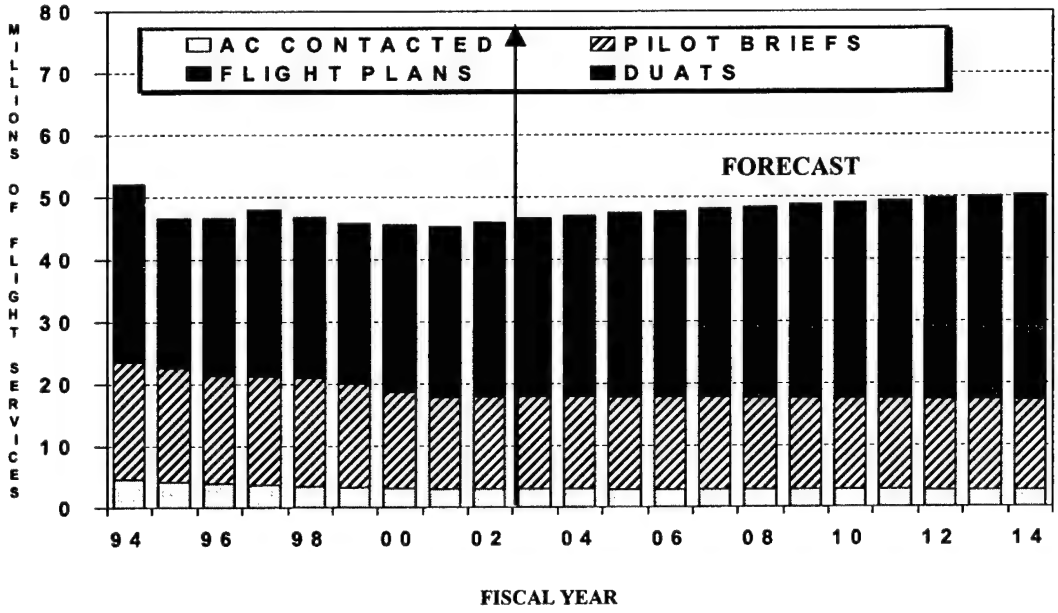
Total traditional (non-automated) flight services originating at FAA flight service stations are projected to post an across the board increase in 2003. This based on FSS activity measure trends for the first quarter of 2003. In absolute numbers, the number of total flight services is expected to decrease slightly to 28.9 million in 2003. For the balance of the forecast period FSS activity is expected to continue to decline slightly. By the end of the forecast period, total flight services provided by the FAA flight service stations are projected to total 28.6 million.

The number of pilot briefings is projected to decrease 1.8 percent to 7.32 million in 2003, and continue declining slowly throughout the remainder of the forecast period. Over all, pilot briefs are projected to decline from 7.46 million in 2002 to 7.16 million in 2014, an average annual rate of decline of 0.3 percent.

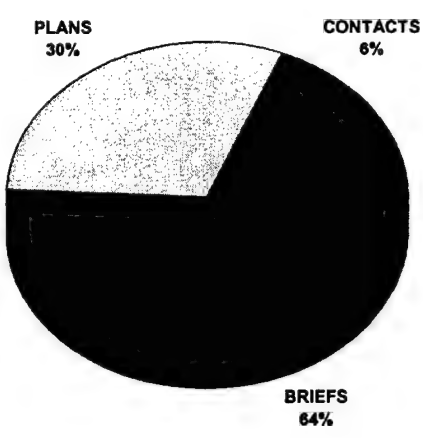
FSS flight plans originated at flight service stations are projected to decrease 2.4 percent in 2003 continuing the trend that began in the middle of FY 2002. After declining slightly for the next two years, total flight plans originated are forecast to grow 0.4 percent per year for the duration of the forecast. By the year 2014, total flight plans originated are projected to total 5.8 million, unchanged from the level in 2002.

The number of aircraft contacted is forecast to decline from 3.0 million in 2002 to 2.7 million in 2014, a 0.8 percent average annual decline.

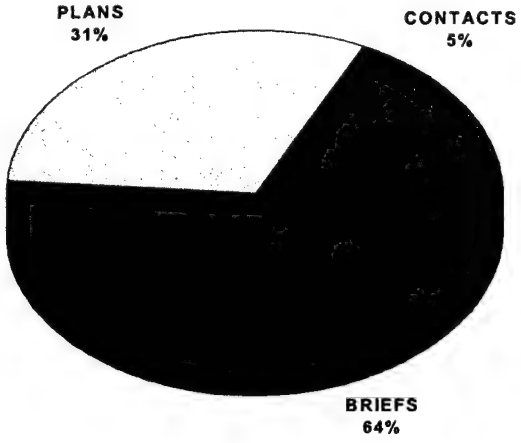
FLIGHT SERVICES ORIGINATED AT FAA FLIGHT SERVICE STATIONS



DISTRIBUTION OF WORKLOAD BY USER GROUP



2002



2014

Automated Service

Several factors resulting from automation will tend to dampen the growth in traditional FSS workload measures, as currently defined. First, pilots can now obtain weather briefings through the Telephone Information Briefing System (TIBS), which does not require contact with a flight service specialist, and is not, therefore, included in the FSS pilot briefings count.

Second, private weather briefing vendors, participating in memorandums of agreement with the FAA, can also provide weather briefings and file flight plans for their customers without going through an FSS. Third, starting February 1990, DUATS became operational. Using DUATS, pilots with access to a computer, modem, and telephone can directly access a national weather data base for weather briefings and flight plan filing without ever going through an FSS.

This automated access may be through the pilot's own computer or through those of fixed-based operators offering the service to their customers. None of the flight planning services provided through the above sources are included in the FSS workload measures.

During 2002 there were a total of 7.1 million DUATS transactions. If each transaction involves a weather briefing, this represents 7.1 million pilot briefs. In addition, approximately 1.2 million flight plans were filed through the DUATS system. Using the weighted total flight services formula (two times the sum of pilot briefs and flight plans filed), this translates into approximately 16.5 million total flight services that are not included in the FAA flight service station workload measure.

DUATS transactions are projected to increase from 7.1 million in 2002 to 7.4 million in 2003 (up 4.0 percent). During the period 2002 through 2014, DUATS transactions are forecast to increase at an average annual rate of 1.9 percent, reaching 8.8 million in 2014.

For the entire forecast period, flight plans filed through DUATS are expected to increase from approximately 1.2 million to 1.7 million in 2014, a 3.3 percent average annual increase. By the year 2014, total services provided through DUATS are projected to account for 21.1 million flight services, or 41.7 percent of total system services.

Total Flight Services

The decline in activity at FAA flight service stations since the mid 1980s is the result of the process of FSS consolidation, and the growing acceptance and utilization of DUATS services.

Total flight services, including non-automated and automated services, are expected to increase 1.8 percent in 2003 to 46.7 million. By 2014 total flight services are forecast to reach 50.5 million, an average annual increase of 0.8 percent over the 12-year forecast period.

CHAPTER VIII

FORECAST ACCURACY

CHAPTER VIII

FORECAST ACCURACY

The Federal Aviation Administration (FAA) has developed econometric forecast models and established a forecast process that attempts to anticipate changes that may affect the future direction of the aviation industry. Using this forecast process, the FAA annually provides 12-year forecasts of aviation demand and activity measures, that are, in turn, used for aviation-related personnel and facility planning. The FAA frequently sponsors workshops to critique techniques and practices currently used by the FAA and other aviation forecasters, and to examine the outlook for the aviation industry and its prospects for future growth. The workshops focus on the forecasting process and ways to improve the reliability and utility of forecasting results.

Tables VIII-1 and VIII-2 provide some measure of the accuracy of FAA projections of aviation demand and workloads at FAA facilities. The tables compare forecasts for both short- and long-term periods. The short-term period, 1 to 5 years, is the critical period for personnel planning; the long-term period, 10 years out, is important for facility planning. The two key FAA forecasts are domestic revenue passenger miles (RPMs) and aircraft handled at FAA en route centers, the former used as one of the predictors of the latter.

For short-term trends, forecast errors normally tend to be modest. However, evaluation of the 2002 forecasts demonstrates the impact that exogenous variables can have on forecast accuracy. As a result of the uncertain environment created by the terrorist attacks of September 11th, the 2002 domestic RPM forecast was 4.0 percent lower than the actual results for the year--443.6 billion compared to a forecast of 425.8 billion. [1] This forecast error is the second highest one-year error recorded since 1994, only behind the forecast error for 2001,--also impacted by the events of September 11th. Over the last 7 years, the average absolute 1-year RPM forecast error is 2.6 percent (2.4 percent for the 6 years prior to 2002, and 1.9 percent for the 5 years prior to 2001). The average 1-year forecast error is -0.7 percent for the 7 years--5 of the forecast years being underestimated and 2 of the forecast years being overestimated.

The forecast for aircraft handled in 2002 was 43.2 million compared to an actual of 43.7 million--resulting in the forecast being 1.2 percent lower than actual. The average absolute 1-year forecast error over the last 7 years is 1.8 percent (1.9 percent for the 6 years

[1] The definition of air carriers was changed in 2002 to exclude regional/commuters reporting on Form 41. Previous forecasts were rebased using the new historical database and previous forecast growth rates.

TABLE VIII-1

U.S. LARGE COMMERCIAL AIR CARRIERS
SCHEDULED DOMESTIC REVENUE PASSENGER MILES (RPMs)
FORECAST EVALUATION

Year Being Forecast	Actual RPMs (Billions)	Forecast RPMs (Billions) Published -- Years Earlier					
		1 Year	2 Years	3 Years	4 Years	5 Years	10 Years
1996	412.7	399.3	406.1	383.2	405.5	403.0	465.0
1997	434.6	433.2	420.3	426.6	399.9	422.0	507.5
1998	444.7	453.0	451.6	441.0	443.8	414.9	509.2
1999	463.1	455.0	467.6	467.7	455.2	459.5	496.4
2000	490.0	479.0	466.1	482.4	484.1	469.6	492.6
2001	483.8	506.3	493.9	477.9	498.8	501.4	485.0
2002	443.6	425.8	527.0	515.7	505.7	528.8	509.8
2003		***455.6***	485.4	548.1	533.2	527.5	499.9
2004			***473.0***	507.7	571.7	556.2	553.3
2005				***489.6***	530.6	596.9	567.6
2006					***506.5***	553.1	622.1
2007						***523.9***	649.6
2008							650.4
2012							***624.9***

Year Being Forecast	Forecast RPMs Percent Error Published--Years Earlier					
	1 Year	2 Years	3 Years	4 Years	5 Years	10 Years
1996	(3.2)	(1.6)	(7.1)	(1.7)	(2.3)	12.7
1997	(0.3)	(3.3)	(1.8)	(8.0)	(2.9)	16.8
1998	1.9	1.5	(0.8)	(0.2)	(6.7)	14.5
1999	(1.8)	1.0	1.0	(1.7)	(0.8)	7.2
2000	(2.3)	(4.9)	(1.6)	(1.2)	(4.2)	0.5
2001	4.7	2.1	(1.2)	3.1	3.6	0.3
2002	(4.0)	18.8	16.3	14.0	19.2	14.9

Note on how to read this table: In 2001 the FAA forecast 425.8 billion RPMs would occur in 2002. In fact, 443.6 billion RPMs were recorded, meaning the forecast was 4.0 percent lower than actual.

The 2002 forecast is shown in bold italics.

TABLE VIII-2

FAA ARTCC AIRCRAFT HANDLED FORECAST EVALUATION

Year Being Forecast	Actual Activity (Millions)	Forecast Activity Level (Millions) Published -- Years Earlier					
		1 Year	2 Years	3 Years	4 Years	5 Years	10 Years
1996	40.4	41.1	40.7	39.4	40.0	41.1	44.0
1997	41.4	40.9	42.2	41.5	40.3	40.7	46.0
1998	43.2	42.0	41.8	43.4	42.4	41.1	46.1
1999	44.7	44.2	42.6	42.5	44.4	43.4	46.0
2000	46.0	45.7	45.2	43.2	43.5	45.3	47.1
2001	45.2	47.0	46.8	46.2	44.2	44.4	46.6
2002	43.7	43.2	48.1	48.0	47.3	45.2	45.1
2003		***43.6***	45.4	49.3	49.0	48.4	45.0
2004			***44.8***	46.5	50.4	50.1	47.3
2005				***46.0***	47.6	51.8	49.3
2006					***47.0***	48.6	48.5
2007						***48.0***	49.6
2008							54.2
2012							***53.2***

Year Being Forecast	Forecast Activity Percent Error Published--Years Earlier					
	1 Year	2 Years	3 Years	4 Years	5 Years	10 Years
1996	1.7	0.7	(2.5)	(1.0)	1.7	8.9
1997	(1.2)	1.9	0.2	(2.7)	(1.7)	11.1
1998	(2.8)	(3.2)	0.5	(1.9)	(4.9)	6.7
1999	(1.1)	(4.7)	(4.9)	(0.7)	(2.9)	2.9
2000	(0.7)	(1.8)	(6.1)	(5.5)	(1.6)	2.3
2001	4.0	3.5	2.1	(2.3)	(1.8)	3.0
2002	(1.2)	10.1	9.8	8.2	3.4	3.1

Note on how to read this table: In 2001 the FAA forecast 43.2 million aircraft would be handled in 2002. In fact, 43.7 million aircraft were recorded, meaning the forecast was 1.2 percent lower than actual.

The 2003 forecast is shown in bold italics.

prior to 2002, and 1.5 percent for the 5 years prior to 2001). The average 1-year forecast error is 0.2 percent, with 5 out of the last 7 forecasts underestimating the number of aircraft handled.

The 10-year out forecast errors tend to be larger because of unanticipated external events that have long-term impacts on the aviation system. Contributing external factors impacting the long-term forecasting accuracy of RPMs and aircraft handled include the 1991 Gulf War and the concomitant rise in fuel prices; the outbreaks of terrorism in 1986, 1991, and 2001; the Southeast Asian financial crisis in 1997-98; and the events of September 11th. Since the FAA does not use cyclical economic projections in preparing its long-term forecasts, the 2001 economic recession was not considered in any of the forecasts prepared prior to 2001.

For the 7-year period 1996 through 2002, the average absolute 10-year forecast error for domestic RPMs is 9.6 percent and the average absolute 10-year forecast error for aircraft handled is 5.4 percent. The evaluation of forecasts published in 1992 (for 2001) and 1993 (for 2002) indicate that the forecast errors for domestic RPMs are 0.3 and 14.9 percent, respectively. For aircraft handled, the error for the forecasts published in 1992 and 1993 was just over 3.0 percent. This statistical comparison highlights the significant impact that unanticipated exogenous events, or the lack thereof, can have on the long-term accuracy of the forecasts. It should be noted, however, that the errors for forecasts prepared prior to 2002 will continue to widen because of the events of September 11th.

THE FAA AVIATION FORECASTING PROCESS

INTRODUCTION

The FAA's forecasting process is a continuous and interactive one that involves the FAA Statistics and Forecast Branch, as well as other FAA offices, government agencies, and aviation industry groups. In addition, the process uses various economic and aviation databases, econometric models and equations, and other analytical techniques.

Forecasting aviation activity is an essential component of the FAA's planning process. The forecasts are used to determine staffing levels and capital expenditures required to accommodate the growth of aviation activity while maintaining a safe, secure, and efficient environment. The forecasts are also used for short-term budget preparation and trust fund analysis as well as cost-benefit and regulatory analyses.

The relative importance of the forecasting function in the planning process can be gauged by examining the National Airspace System (NAS) Architecture. The NAS architecture is a 15-year plan, with the first 5 years focusing on the Capital Investment Plan (CIP). The CIP identifies the short-term requirements for sustaining and improving the safety, security, and efficiency in the NAS. The sizable investments being made in the National Airspace System make it essential for the FAA to develop and use the most accurate and reliable forecasts possible. Thus, the periodic review and evaluation of the forecasting procedures, models, assumptions, and results constitute essential parts of the process.

The FAA considers over 100 variables when producing a set of national forecasts. Of these,

four economic independent variables are obtained from sources external to the FAA. Consequently, the FAA has no control over these truly exogenous variables. There are 12 quantifiable air carrier forecast assumptions and 3 quantifiable regional/commuter carrier forecast assumptions. These forecast assumptions are made by the FAA analysts who develop the forecast. There are 83 aviation variables that are not FAA workload measures, but influence the workload measures in one way or another. Finally, there are over 30 aviation variables that are workload measures used by the FAA for policy and planning considerations, and for personnel and investment planning.

Table VIII-3 at the end of this chapter contains a list of the variables, the sources of the data, and their relationship to the forecast process. Forecasts of the economic variables are developed outside the FAA. All other forecasts are developed by the FAA.

Research undertaken in the early- and mid-1970s indicated that some measures of economic activity (such as gross domestic product or total employment) and some measures of prices (for example, airline fares and aviation fuel prices) were useful predictors of aviation activity. Some unique events (including the failure of U.S. air carriers to follow rational pricing policies; e.g., the destructive fare wars of 1986 and 1992; and the prolonged depressed state of the general aviation manufacturing industry) have altered the relationships between key aviation variables and the economic variables used previously. It has been difficult, therefore, to produce economic or econometric models that predict aviation activity with the same degree of reliability as the models developed in earlier periods. Thus, for the present, the forecasters must rely to a greater degree on subjective judgment, evaluation, and expertise than was required previously. This is not at all unusual in times when significant structural changes are taking place in a volatile industry.

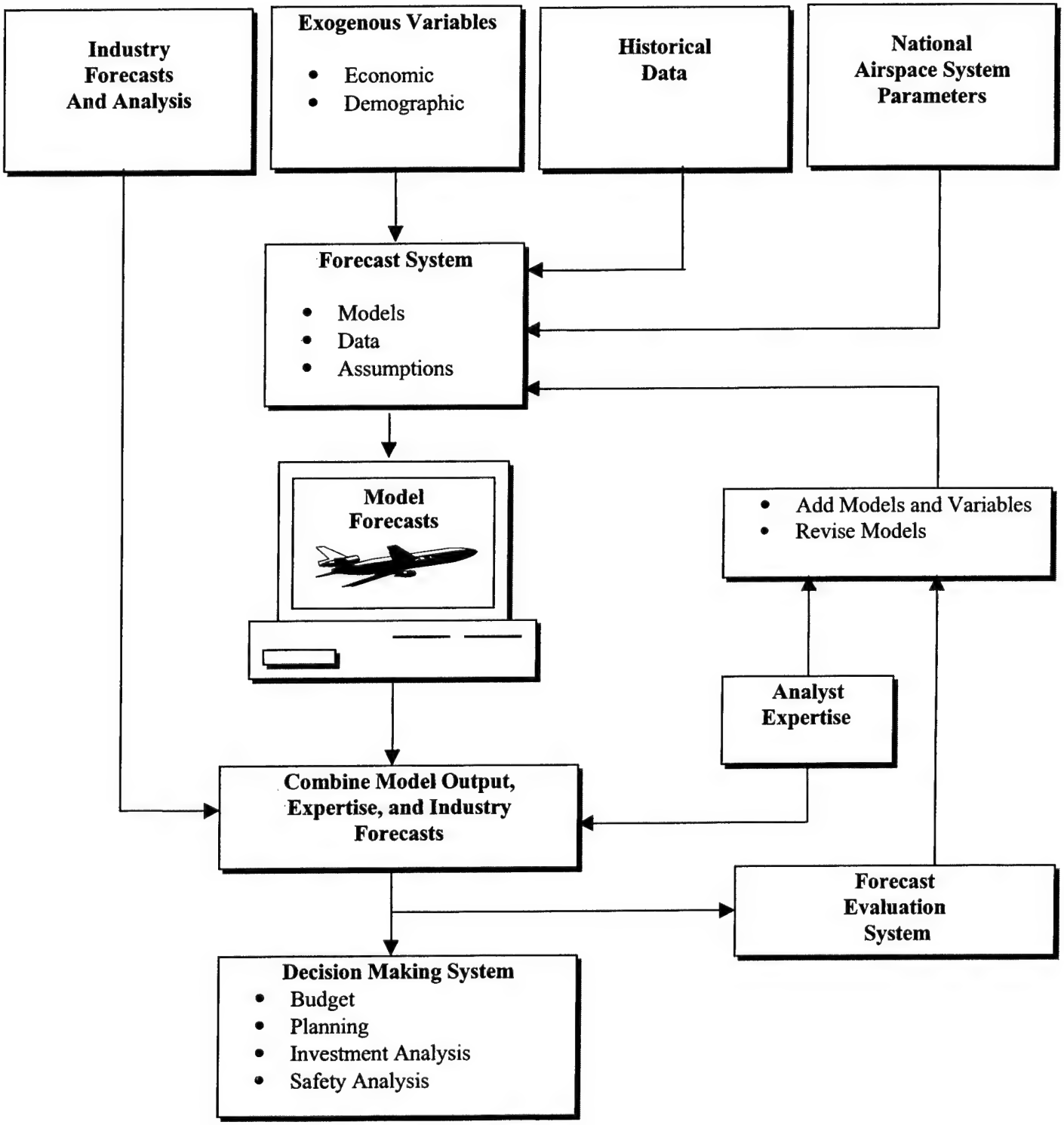
THE FAA FORECASTING PROCESS

During the past several years the FAA has adopted a decision-theoretic forecasting system. The approach is generally accomplished in two stages. Initially, projections are made with the use of econometric and time series models. The model equations and outcomes are then adjusted based upon "expert industry opinion" to arrive at posterior forecasts for use in the decision-making process. The flow diagram on page VIII-6 shows a generalized version of the FAA aviation forecasting process.

In light of the events of September 11th, this year's forecast process was similar to the process used last year, but somewhat different than used in previous years. Near term forecasts (2003 through 2004 for air carrier, and 2003 through 2005 for regional/commuter) were developed utilizing assumptions regarding capacity and expert judgment as to the degree and timing of the industry recovery from the events of September 11th. Forecasts for the remaining years were based on results derived from the econometric and time series models. It is believed that optimum policy forecasts can only be achieved by combining model forecasts and judgment.

In general, these models are relatively simple descriptions of very complex systems, they cannot account for all the political, social, psychological, and economic factors and their interactions that will lead to a particular set of outcomes. Therefore, it is essential to use judgment to account for the complexities of the operating environment. This can be accomplished by adjusting the exogenous variables, adjusting the model outputs, or revising the models initial parameter estimates.

FAA FORECASTING SYTEM



FORECASTING EVALUATION

It is important to evaluate the forecast results and to determine the causes of the deviations of the forecast values from the actual values observed in the real world. Large forecast errors can lead to inefficient allocation of resources which, in turn, could lead to capacity constraints and delays or to excess capacity in the National Airspace System. For this reason, the FAA continuously evaluates the forecasting process and its results.

The analysis of the errors generally identifies the causes of the deviations and helps determine the proportion due to improper model specifications, erroneous forecasts of independent variables, erroneous forecast assumptions, or incorrect judgments and opinions. If warranted, the forecast error analysis may lead to a reformulation or respecification of the model and to additions or deletions of independent variables, revisions of forecast assumptions, and/or changes in analysts' opinions and judgments about future events.

The evaluation of the forecast process proceeds on several fronts. On a monthly basis, the FAA tracks its short-term forecasts of commercial air carrier traffic (enplanements and RPMs), aircraft operations, instrument operations, IFR aircraft handled, and flight services vis-à-vis actual carrier traffic data reported to DOT and actual activity counts at the FAA facilities. This tracking system alerts FAA management to unexpected deviations from the trends suggested by the forecasts. Inquiries are then initiated to determine the cause(s) of the differences and revised short-term forecasts may be generated, if necessary.

To help the analysts make correct decisions and informed judgments when developing the forecast assumptions, the FAA meets with industry representatives to discuss industry trends, recent developments, and possible future courses of events. Every 2 years, for example, in cooperation with the National Academy of Sciences, Transportation Research Board (TRB), the FAA sponsors an International Workshop on Future Aviation Activities--"Forecast Assumptions Workshop." This "by invitation only" workshop is attended by some 120-140 industry planners and forecasters representing airlines, aircraft manufacturers, engine manufacturers, trade associations, academic institutions, and other industry groups. The 12th International Workshop on Future Aviation Activities was held in Washington, DC on September 18-20, 2002.

Workshops participants are divided into nine concurrent panels to discuss sectoral trends and problems in the following areas: (1) domestic air carriers, (2) international air carriers, (3) regional and commuter airlines, (4) air cargo, (5) airports and infrastructure, (6) commercial aircraft fleets and manufacturers, (7) light personal and general aviation, (8) business aviation, and (9) vertical flight (rotorcraft).

The subgroups are instructed to critique FAA aviation forecasts for their specific areas. Each subgroup is asked to identify specific assumptions about the short- and long-term future trends of the economic and aviation variables that are important to their segments of the industry, to indicate why these trends are considered important, and to explain why specific trends are anticipated. After discussing the FAA forecast and the group's assumptions, each group attempts to reach a consensus about the key variables affecting the industry and the most likely future courses of these variables. The findings of these workshops are published by the TRB.

In past years, the TRB workshops have provided discussions beneficial to the participants, while at the same time providing FAA analysts with a benchmark for preparing future aviation forecasts and for evaluating forecasts prepared by other organizations. When the workshop

scheduled for September 2001 was cancelled because of the September 11th terrorist attacks, the FAA missed a valuable opportunity to meet with industry professionals to discuss the implications of the terrorist attacks on the future of the industry. Thus, this year's meeting was crucial for discussing these events.

Throughout the year formal and informal meetings with individuals and representatives of specific aviation groups are held, and this is another method used by the FAA to solicit input and comments on FAA forecasts. Meetings are held regularly with aircraft manufacturers and with members of the various aviation trade associations. In addition, FAA analysts maintain one-on-one contact with many industry representatives and also attend annual conferences/meetings conducted by the aviation trade associations.

The largest setting for industry dialogue and critique regarding the FAA aviation forecast process is the annual FAA Aviation Forecast Conference. Now in its 28th year, the conference is used as a forum to release the forecast results for the upcoming 12 years. The last conference was held March 12-13, 2002, in Washington, DC. Participants and attendees were over 500 strong and included airline and airport executives, aircraft and engine manufacturers, trade associations, aviation consultants, consumer groups, industry representatives, and the news media. To the maximum extent possible, the FAA responds to questions raised about the forecasts both during and after the conference.

An important part of the conference is the opportunity for various leaders and experts in the aviation industry to make technical presentations on a variety of topics of interest to the aviation community. The FAA also receives valuable information and insights through the papers presented at the forecast conference. Last year's conference proceedings are published on the Internet.

Also in 2002, the 10th FAA General Aviation Forecast Conference was held in Wichita, Kansas, on April 14-16, 2002. The theme of the conference was "Into the 2nd Century of Powered Flight," and provided an expanded national forum for discussing problems and issues facing the general aviation industry.

Finally, the FAA requests FAA regional and state participation in the evaluation of the forecast process. For example, the aircraft handled and terminal area forecasts are distributed to FAA regional offices for review and comment. The comments and changes are incorporated in final facility-level reports. In the case of terminal area forecasts, the FAA regions can make changes directly on personal computers. However, the final facility-level forecasts derived by this procedure must be consistent with the national forecasts.

Periodically, the FAA prepares technical reports comparing forecast accuracy of key workload measures with forecast accuracy of economic variables prepared by the major forecasting services. Based on the results of these studies, the FAA forecasts compare favorably with those produced by the major forecasting services.

TABLE VIII-3

FAA AVIATION FORECAST VARIABLES AND DATA SOURCES

TYPES OF VARIABLES AND VARIABLE NAMES	DATA SOURCES
ECONOMIC	
ECONOMIC ASSUMPTIONS	
Gross Domestic Product (GDP)	OMB, CBO, Global Insight
Consumer Price Index – All Urban Consumers (CPIU)	OMB, CBO, Global Insight
Oil and Gas Deflator	OMB, Global Insight
Energy Deflator	CBO
AIR CARRIER	
FORECAST ASSUMPTIONS	
Domestic Operations	
Average seats per aircraft	BTS/computed
Average passenger trip length[2]	BTS/computed
Revenue per passenger mile (current $)	BTS/computed
Revenue per passenger mile (2002 $)	Computed
Average jet fuel prices (current $)	BTS/computed
Average jet fuel prices (2002 $)	Computed
International Operations (U.S. Carriers)	
(Same as Domestic)	(Same)
SCHEDULED PASSENGER TRAFFIC	
Domestic	
Revenue passenger miles (RPMs)	BTS
Revenue passenger enplanements	BTS
Available seat miles (ASMs)	BTS
Load factors	Computed
International (U.S. Carriers)	
RPMs by World Regions	BTS
Revenue passenger enplanements by World Regions	BTS

[2] Result of econometric models for RPMs and Enplanements

FAA AVIATION FORECAST VARIABLES AND DATA SOURCES (CONTINUED)

TYPES OF VARIABLES AND VARIABLE NAMES	DATA SOURCES
AIR CARRIER (CONTINUED)	
SCHEDULED PASSENGER TRAFFIC (CONTINUED)	
International (U.S. Carriers)	
ASMs by World Region	BTS
Load factors	Computed
International (U.S. and Foreign Flag Carriers)	
Passenger enplanements	INS
SCHEDULED AND NONSCHEDULED CARGO TRAFFIC	
Domestic and International (U.S. Flag Carriers)	
Total Air Cargo Revenue Ton Miles (RTMs)	BTS
Freight/Express RTMs	BTS
Mail RTMs	BTS
Air Cargo RTMs: All-Cargo Carriers	BTS
Freight/Express RTMs	BTS
Mail RTMs	BTS
Air Cargo RTMs: Passenger Carriers	BTS
Freight/Express RTMs	BTS
Mail RTMs	BTS
FLEET	
Large jet aircraft: Passenger	FAA
Large jet aircraft: Cargo	FAA
HOURS FLOWN BY EQUIPMENT TYPE	
Large jet aircraft	BTS
FUEL CONSUMED	
Jet	
Domestic air carriers	BTS
International air carriers	BTS
General aviation	FAA/APO-110
Aviation Gasoline	FAA/APO-110

FAA AVIATION FORECAST VARIABLES AND DATA SOURCES (CONTINUED)

TYPES OF VARIABLES AND VARIABLE NAMES	DATA SOURCES
REGIONAL/COMMUTER	
FORECAST ASSUMPTIONS	
Average seats per aircraft	BTS/Computed
Average passenger trip length	BTS/Computed
Average load factor	BTS/Computed
PASSENGER TRAFFIC	
Revenue passenger enplanements	BTS
RPMs	BTS
ASMs	BTS
FLEET	
Aircraft less than or equal to 70 seats	FAA
HOURS FLOWN	
Total for all passenger airlines	BTS
GENERAL AVIATION	
FLEET	
Active aircraft by equipment type	FAA/APO-110
NUMBER OF AIRCRAFT BY REGION	
Total aircraft in each of nine FAA Regions	FAA/APO-110
HOURS FLOWN	
Hours flown by equipment type	FAA/APO-110
FUEL CONSUMED	
Fuel consumed by equipment type	FAA/APO-110
PILOTS	
Active pilots by certificate type	FAA/Mike Monroney Aeronautical Center

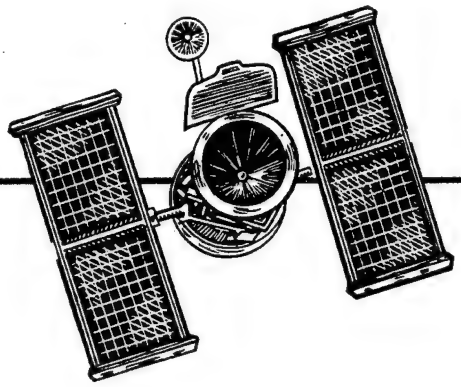
FAA AVIATION FORECAST VARIABLES AND DATA SOURCES (CONTINUED)

TYPES OF VARIABLES AND VARIABLE NAMES	DATA SOURCES
FAA WORKLOAD MEASURES	
FAA TOWERS	
Number of FAA Towers	FAA/APO-130
Number of Contract Towers	FAA/ATP-140
Aircraft Operations:	
Itinerant and local operations by aviation category	FAA/APO-130
Instrument operations by aviation category	FAA/APO-130
Non-IFR Instrument Operations:	
Terminal control areas	FAA/APO-130
Expanded radar service areas	FAA/APO-130
AIR ROUTE TRAFFIC CONTROL CENTERS	
IFR departures by aviation category	FAA/APO-130
IFR overs by aviation category	FAA/APO-130
FLIGHT SERVICE STATIONS	
IFR-DVFR flight plans originated	FAA/APO-130
VFR flight plans originated	FAA/APO-130
Pilot briefings	FAA/APO-130
Aircraft contacted by aviation category	FAA/APO-130
IFR-DVFR aircraft contacted	FAA/APO-130
VFR aircraft contacted	FAA/APO-130

FAA AVIATION FORECAST VARIABLES AND DATA SOURCES (CONTINUED)

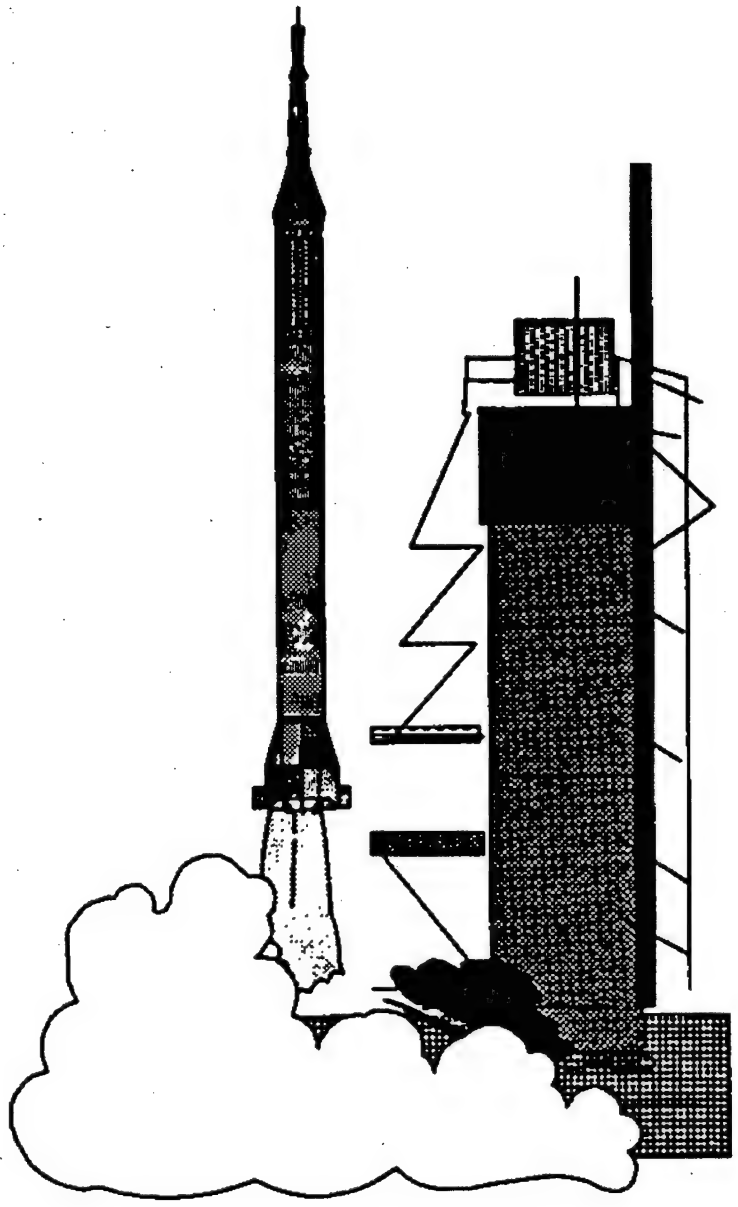
TYPES OF VARIABLES AND VARIABLE NAMES	DATA SOURCES
TERMINAL AREA FORECASTS (3,493 Towered and Nontowered Airports)	
ENPLANEMENTS	
U. S. Flag Carrier	BTS
Foreign Flag Carrier	INS/BTS
Regional/Commuter	BTS
Air Taxi	FAA/VNTSC
OPERATIONS	
Towered Airports:	
Aircraft operations by aviation segment	FAA/APO-130
Scheduled commuter	OAG
Nontowered Airports	FAA/NFDC
Scheduled commuter	OAG

APO-110--Statistics and Forecast Branch, FAA
APO-130--Information Systems Branch, FAA
ATP-140--Contract Air Traffic Services, FAA
BTS--Bureau of Transportation Statistics, Department of Transportation
CBO--Congressional Budget Office
Global Insight--formerly DRI-WEFA, Inc.
INS--Immigration and Naturalization Service, Department of Justice
NFDC--National Flight Data Center, FAA
OAG--North American Official Airline Guide
OMB--Office of Management and Budget
VNTSC--Volpe National Transportation Systems Center, Research and Special Programs Administration, Department of Transportation



CHAPTER IX

COMMERCIAL SPACE TRANSPORTATION



CHAPTER IX

COMMERCIAL SPACE TRANSPORTATION

The Federal Aviation Administration's (FAA) Associate Administrator for Commercial Space Transportation (AST) licenses and regulates U.S. commercial space launch activity as authorized by Executive Order 12465, *Commercial Expendable Launch Vehicle Activities*, and *49 U.S. Code Subtitle IX, Chapter 701 (*formerly the *Commercial Space Launch Act of 1984*). AST's mission is to license and regulate commercial launch and reentry operations to protect public health and safety, the safety of property, and the national security and foreign policy interests of the United States. In addition, the FAA licenses commercial launch sites. *Chapter 701* and the 1996 *National Space Policy* also direct the FAA to encourage, facilitate, and promote commercial launches.

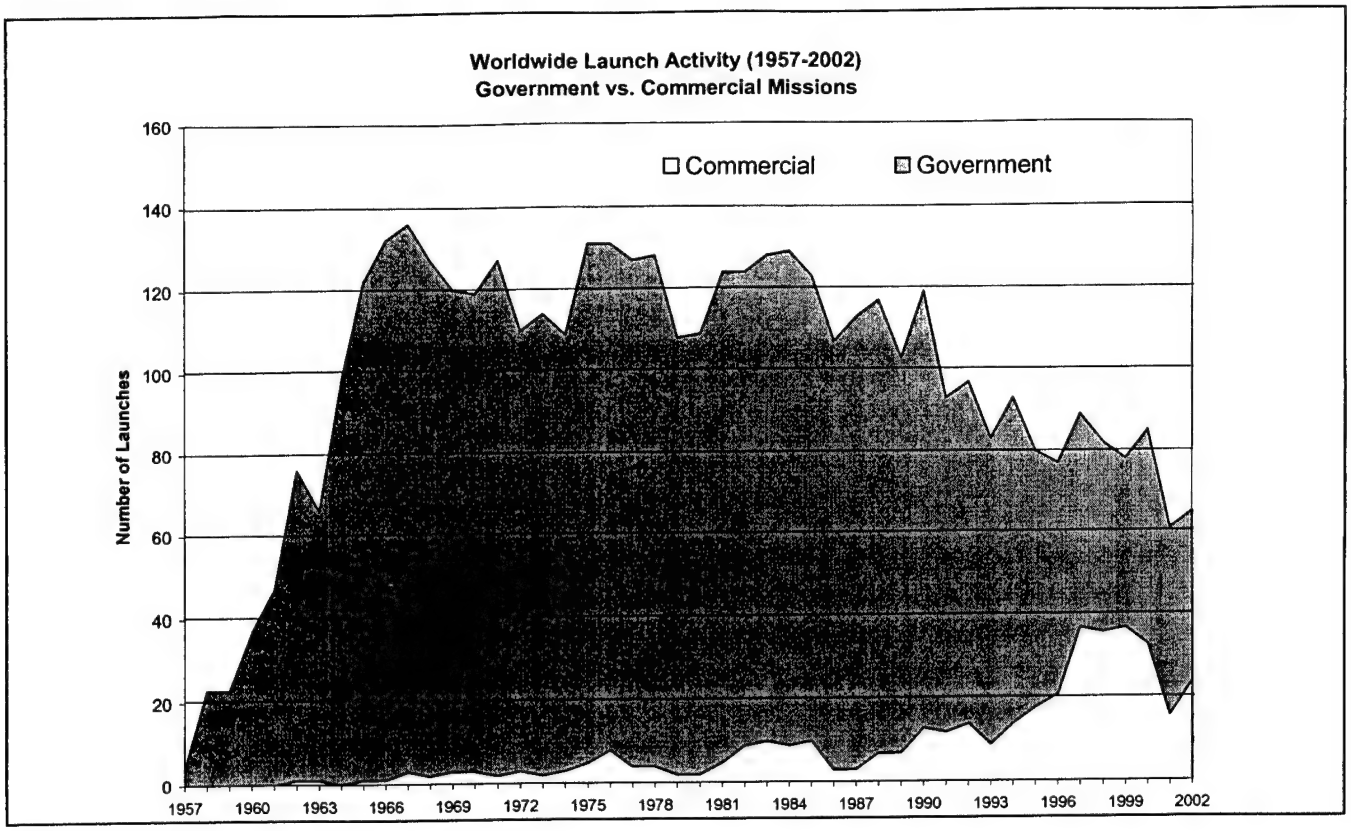
INTRODUCTION TO COMMERCIAL SPACE TRANSPORTATION

WHAT IS COMMERCIAL SPACE TRANSPORTATION?

The term "commercial space transportation" refers generally to the launch and/or reentry of an object into or from space by a private sector, non-governmental entity. Within the United States, commercial space launches are conducted by companies, such as Boeing, International Launch Services (ILS), and Orbital Sciences Corporation, using expendable launch vehicles (ELVs).[1] Worldwide, commercial launch services are currently offered by corporations from the United States, Europe, Russia, China, and Japan.

The popular definition of "commercial launch" has evolved over time as the capabilities of commercial companies and private citizens have increased. From a legal perspective, the FAA licenses commercial launches and reentries by U.S. citizens or U.S. companies within and outside the United States that are, in general, privately or commercially procured for commercial or other payloads, including foreign payloads. The FAA may issue a launch license for a launch vehicle carrying a U.S. government payload if the sponsoring agency chooses not to have substantial involvement into launch activity. Most launches of U.S. government payloads are operated by either the Air Force or the National Aeronautics and Space Administration (NASA) using launch vehicles built under contract by commercial companies. The FAA also regulates and licenses suborbital launches and reentries, depending on certain launch profile factors.

[1] Expendable launch vehicles are used only once, with stages falling back to Earth or remaining in orbit after use.



COMMERCIAL USE OF SPACE

Since the launch of Sputnik in 1957, spaceflight has largely been a government endeavor. Even though satellites serving commercial or quasi-commercial purposes entered into service in the early 1960s, the business of launching them was strictly a government affair. Many of the early commercial satellites launched were telecommunications spacecraft located in geosynchronous orbit[2] (GSO) used to relay video and audio signals for television and telephone services.

Commercial launches of satellites that serve commercial and other purposes have steadily increased since the early 1980s. Until the mid-1990s, commercial satellites were almost exclusively telecommunications satellites located in GSO. Since 1997, new satellite markets have opened up for commercial mobile telephones, data messaging, and remote sensing in low Earth orbit (LEO) or non-geosynchronous orbit (NGSO).[3] Digital satellite radio services began in North America in late 2001. During 2002, 37 percent of launches conducted worldwide were commercial. Other types of commercial activity are also increasing. For example, two space tourists to date have paid for seats on Russian spacecraft for rides to the International Space Station. Public space travel is expected to increase in the future as current and new entrepreneurial companies develop passenger vehicles capable of suborbital and orbital space flights.

[2] A spacecraft in geosynchronous orbit is synchronized with the Earth's rotation, orbiting once every 24 hours, and appears to an observer on the ground to be stationary in the sky. GSO (also sometimes called GEO) satellites can have arbitrary eccentricity and arbitrary inclination to the Earth's equator and are generally at an altitude of 35,852 kilometers (22,300 miles).

[3] Non-geosynchronous orbit (NGSO) satellites are those in orbits other than GSO. They are located in LEO (lowest achievable orbit to about 2,400 kilometers), medium Earth orbit (MEO, 2,400 kilometers to GSO), and all other high or elliptical orbits or trajectories.

U.S. COMMERCIAL LAUNCH SERVICES

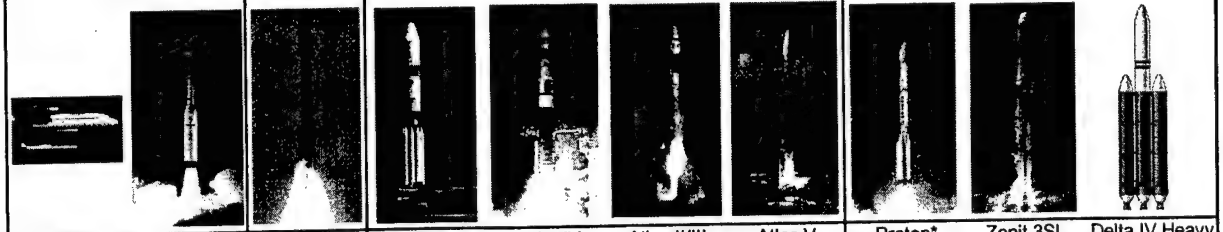
Until the early 1980s, all commercial satellites were launched on rockets owned and operated by the U.S. government, including the Space Shuttle. When Europe's Arianespace began offering launch services for commercial satellites in 1983, an international launch market was created and has since grown to over 15 vehicle families worldwide. Following the passage of the *Commercial Space Launch Act of 1984,* the U.S. government and industry began to transition from government to commercial operations for ELVs. The *Commercial Space Launch Act* authorized the Department of Transportation (DOT) to regulate and license commercial launch activities. (The Office of Commercial Space Transportation was later transferred from the DOT Office of the Secretary to the FAA in November 1995, where it became AST.) Commercial launches licensed by the DOT began in 1989, after the U.S. Government decided to stop launching commercial payloads on the Space Shuttle following the *Challenger* disaster in 1986. From 1989 through 2002, the DOT licensed 146 orbital and suborbital commercial launches.

Currently active ELVs that have orbital launch operations licensed by the FAA are:

- Atlas II, III, and V (intermediate class), all built by Lockheed Martin Corporation and marketed by International Launch Services (ILS);
- Delta II (medium class), III, and IV (intermediate class), all built by The Boeing Company and marketed by Boeing Launch Services (Delta IV heavy class is expected in late 2003);
- Zenit 3SL (intermediate class), built by KB Yuzhnoye (in Ukraine) for the Sea Launch partnership and marketed by Boeing Launch Services; and
- Pegasus XL and Taurus (small class), both built and marketed by Orbital Sciences Corporation (OSC).

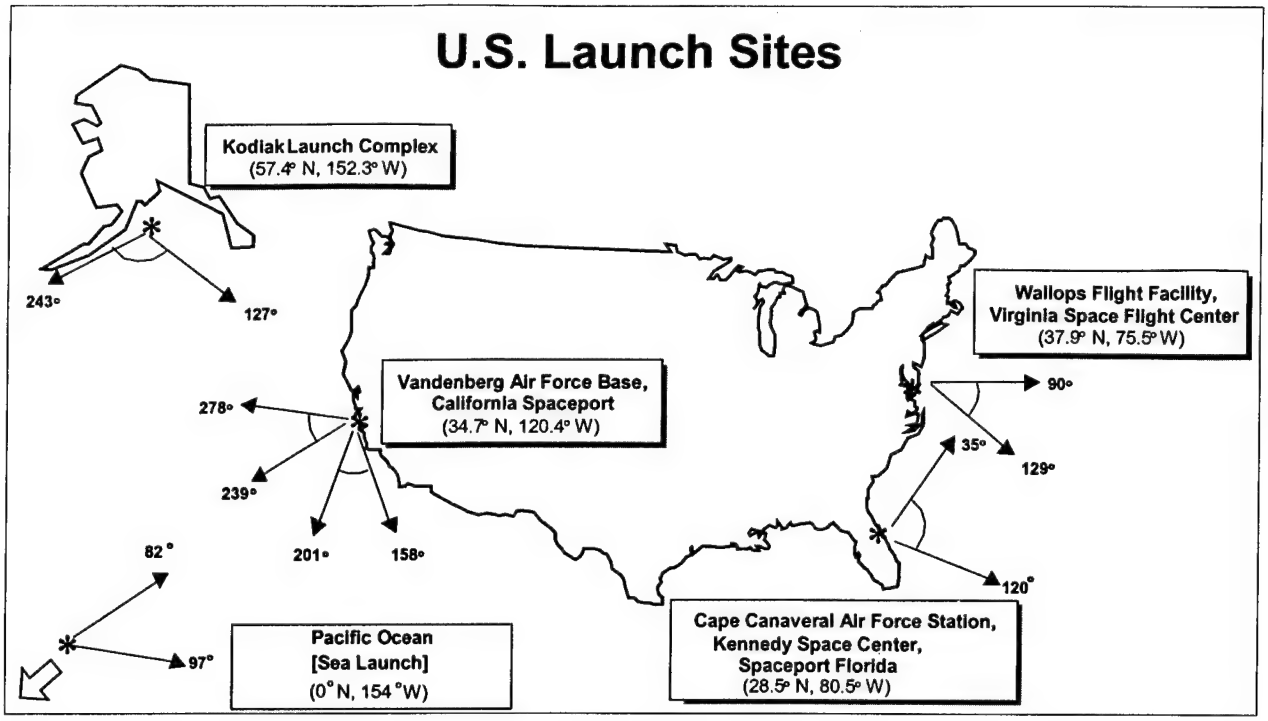
New expendable and reusable launch vehicles are also being developed for commercial and other purposes.

U.S. and International Partner Commercial Launch Systems



	Small		Medium	Intermediate				Heavy		
Vehicle Name	Pegasus	Taurus	Delta II	Delta III	Delta IV	Atlas II/III	Atlas V	Proton*	Zenit 3SL	Delta IV Heavy
Company	OSC	OSC	Boeing	Boeing	Boeing	ILS	ILS	ILS	Sea Launch	Boeing
First Commercial Launch	1993	1998	1989	1999	2002	1990	2002	1996	1999	–

* Not FAA-Licensed



U.S. commercial launches to GSO are launched from the Cape Canaveral Air Force Station (CCAFS) in Florida or from a Pacific Ocean platform by Sea Launch, a multinational corporation. Launches to NGSO can take place from any launch site such as CCAFS, Vandenberg Air Force Base (VAFB) in California, the Wallops Flight Facility in Virginia, or Kodiak Launch Complex in Alaska (see figure "U.S. Launch Sites," above).

FAA/AST has issued four launch site operator licenses to state-run organizations to operate commercial launch sites, or spaceports. They are:

- Spaceport Florida at Cape Canaveral Air Force Station, Florida (license held by Florida Space Authority);
- California Spaceport at Vandenberg Air Force Base, California (license held by Spaceport Systems International);
- Virginia Space Flight Center at Wallops Island, Virginia (license held by Virginia Commercial Space Flight Authority); and
- Kodiak Launch Complex on Kodiak Island, Alaska (license held by Alaska Aerospace Development Corporation), the first spaceport not located on a federal range.

REVIEW OF 2002

The year 2002 was important for the United States, with two new launch vehicles successfully making their debuts after seven years of development in the joint industry-U.S. Air Force Evolved Expendable Launch Vehicle (EELV) program. The Atlas V flew for the first time on August 21, 2002. Boeing's Delta IV launch vehicle made its first successful launch on November 20. These two new vehicles, which carried commercial satellites for their first launches, will be used to launch civil, commercial, and military payloads for U.S. and international customers.

FAA/AST licensed six orbital commercial launches in 2002, up from five during 2001. All were successful. Boeing launched a Delta II and

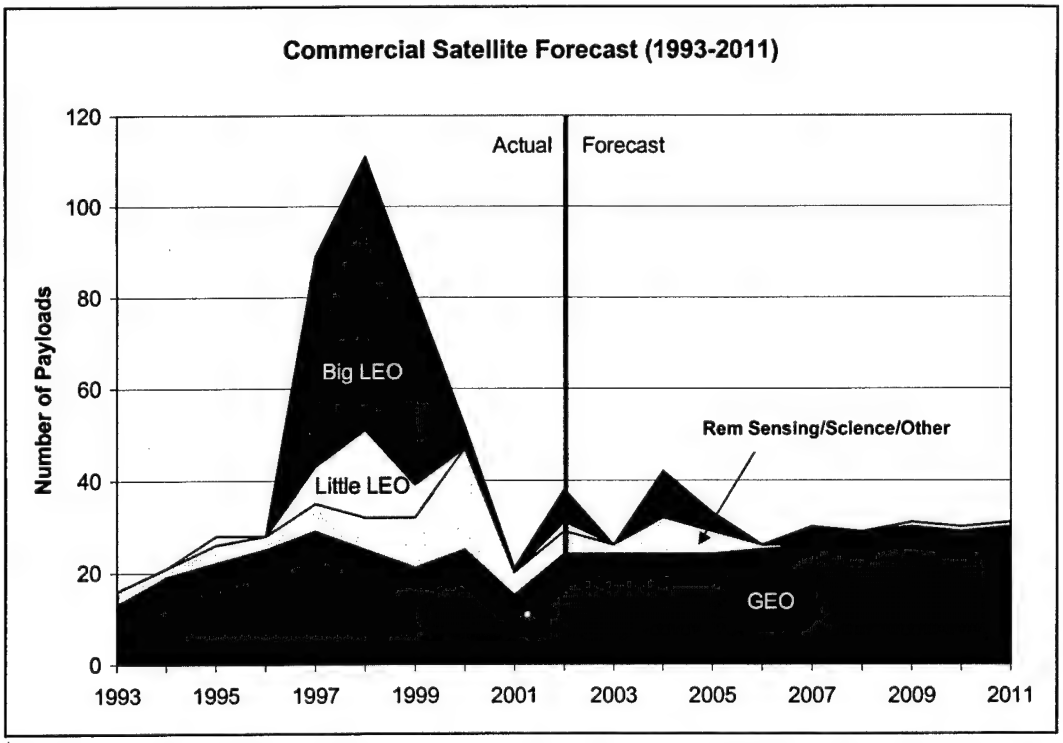
the first Delta IV (Medium Plus). ILS launched an Atlas IIAS, Atlas IIIB, and the first Atlas V (401 series). The Sea Launch partnership, led by Boeing, launched a Zenit 3SL.

The FAA also licensed one suborbital launch, a Terrier-Orion vehicle carrying a hypersonic test payload. The launch was conducted in Australia by Astrotech, a U.S. company.

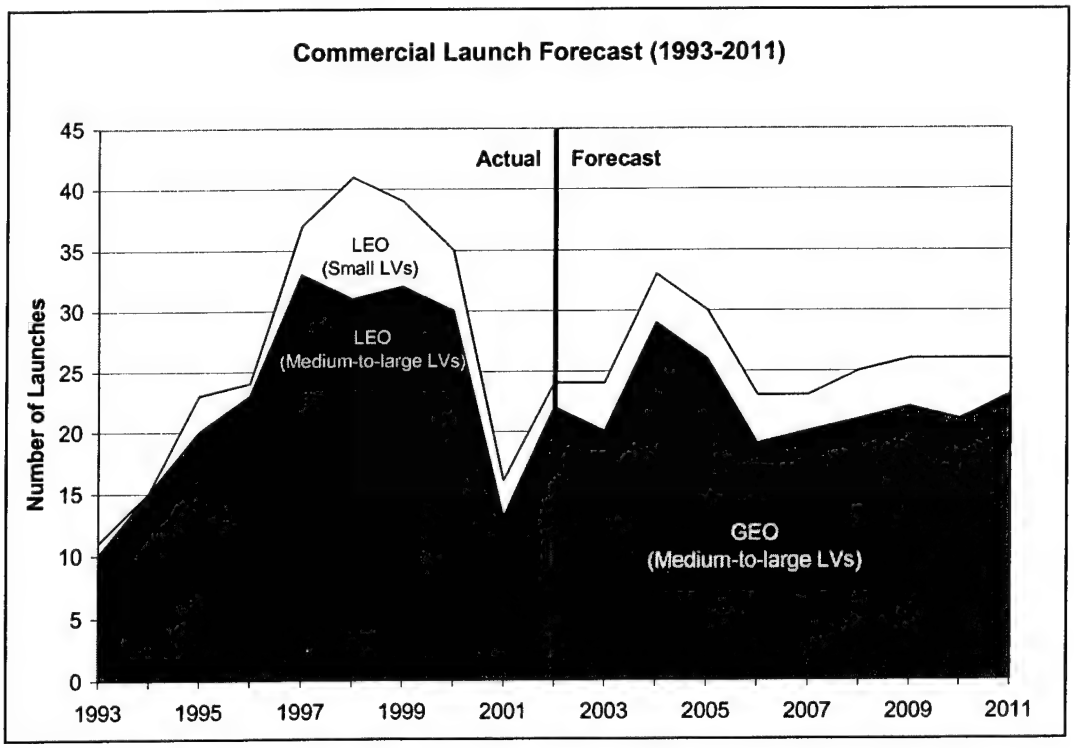
Russian launch ranges deployed 8 vehicles for commercial missions and Europe's Arianespace conducted 10 commercial launch campaigns from Kourou in French Guiana. China did not launch any commercial payloads in 2002. Therefore, including the 5 launches from U.S. ranges and the single flight for Sea Launch, a total of 24 orbital commercial launches were conducted during 2002. There were 65 total worldwide commercial, civil, and military launches, with commercial launches representing about 37 percent of total launches. For more details, see the *Commercial Space Transportation: 2002 Year In Review* report available from the FAA/AST website at *http://ast.faa.gov/rep_study/yir.htm.*

COMMERCIAL SPACE TRANSPORTATION FORECASTS

In May 2002, the FAA and the Commercial Space Transportation Advisory Committee (COMSTAC) published their annual forecast for commercial launch demand, the *2002 Commercial Space Transportation Forecasts.* This forecast combined the *COMSTAC 2002 Commercial Geosynchronousy Launch Demand Model,* which covers satellites that operate in GSO, with the FAA's *2002 Commercial Space Transportation Projections for Non-Geosynchronous Orbits (NGSO).*



"Little LEO" systems (such as ORBCOMM) provide narrowband data communications such as e-mail and two-way paging using frequencies below 1 GHz. The FCC dubbed the systems "little" because they were at lower frequencies than Big LEO systems. Big LEO systems (Iridium and Globalstar) provide mobile voice telephony and data services in the 1-2 GHz frequency range.



The forecast projected an average of nearly 27 commercial orbital launches worldwide annually through 2011.

The 2002-2011 forecasts project an annual average of:

- 20.5 launches of medium-to-heavy vehicles to deploy GSO satellites;
- 2.5 launches of medium-to-heavy vehicles to NGSO; and
- 4 launches to NGSO by small vehicles.

These estimates account for launching multiple manifested payloads, since commercial NGSO and some GSO payloads could be launched in groups on a single launch to reduce costs.

The forecast is based on inputs from across the international satellite and launch services industry and represents the demand for launch services for actual or projected satellite programs in a given year. The forecast is not a prediction of what will actually be launched.

Several factors can affect the year-by-year accuracy of the forecast, including satellite manufacturing delays, launch vehicle components problems, launch failure investigations, or scheduling issues. Regulatory issues, such as satellite export compliance or Federal Communications Commission (FCC) licensing, can come into play. Also, changes in national economies or the business environment can cause satellite companies to alter or cancel their development plans.

The complete forecast report is available at *http://ast.faa.gov/rep_study/forcasts_and_reports.htm*.

GENERAL MARKET TRENDS

The commercial space transportation market is driven largely by the demand for launches of telecommunications satellites. The development of new markets, such as satellite radio and

public space travel, have yet to significantly impact launch demand. The following trends can be expected in the next few years in the commercial space launch industry:

- Continued steady demand for launch of GSO communications satellite systems and a small but increasing demand for remote sensing systems;
- A general trend toward heavier GSO communications satellites;
- A slight increase in the number of small-mass GSO satellites;
- Continued low demand for NGSO satellites, because of business difficulties faced by the first telecommunications constellations;
- Continued international competition by Europe, Russia, and China for launch services and possible new entrants into the commercial launch market from India, Japan, and Brazil;
- U.S. government development of a reusable space vehicle launched on large ELVs; and
- Continued private sector development of expendable and reusable launch vehicles.

CHAPTER X

YEAR-BY-YEAR DATA FOR FAA AVIATION FORECASTS

CHAPTER X

YEAR-BY-YEAR DATA FOR FAA AVIATION FORECASTS

FISCAL YEARS 2003 – 2014

This chapter provides detailed historical data (1997-2002) and forecasts (2003-2014) for aviation demand and activity at FAA air traffic facilities. The following should be noted:

- **Table 20**: Includes regional passenger jets also included in Table 27.
- **Table 27**: Includes all regional passenger aircraft--pistons, turboprops, and regional jets listed in Table 20.
- **Table 33**: Includes the rotorcraft active fleet and hours flown in Tables 29 and 30.

TABLE 1

U.S. SHORT-TERM ECONOMIC FORECASTS

ECONOMIC VARIABLE	FISCAL YEAR 2003				FISCAL YEAR 2004			
	1ST. QTR.	2ND. QTR.	3RD QTR.	4TH. QTR.	1ST. QTR.	2ND. QTR.	3RD QTR.	4TH. QTR.
REAL GDP								
(1996 Chained $, Billions)								
Global Insight	9,499.1	9,575.0	9,653.9	9,745.7	9,852.8	9,988.2	10,097.8	10,195.9
OMB	9,519.4	9,583.0	9,664.2	9,750.6	9,840.2	9,927.6	10,015.9	10,104.8
CBO	9,492.8	9,516.5	9,545.2	9,607.4	9,727.3	9,859.3	9,967.8	10,063.0
OIL AND GAS PRICE INDEX								
(1996 EQUALS 100)								
Global Insight	116.4	114.0	113.3	113.0	114.0	112.0	109.4	108.9
OMB	108.3	104.5	100.4	97.0	94.4	94.8	95.2	95.5
CBO (Energy Deflator)	117.3	117.6	118.4	119.1	119.8	120.6	121.4	122.2
CONSUMER PRICE INDEX								
(1982-84 EQUALS 100)								
Global Insight	181.6	182.5	183.5	184.7	185.8	187.0	188.1	189.3
OMB	181.6	182.4	183.3	184.2	185.2	186.1	187.1	188.1
CBO	181.6	182.5	183.5	184.4	185.4	186.4	187.4	188.5

Source: Global Insight, November 2002; Office of Management and Budget, December 2002; Congressional Budget Office, November 2002.

TABLE 2

U.S. LONG-TERM ECONOMIC FORECASTS

FISCAL YEAR	GROSS DOMESTIC PRODUCT (Billions 1996$)	CONSUMER PRICE INDEX (1982-84=100)	OIL AND GAS PRICE INDEX (1996 = 100)
Historical			
1997	8,074.1	159.8	100.7
1998	8,410.2	162.4	90.8
1999	8,765.9	165.5	89.7
2000	9,140.5	170.8	116.3
2001	9,213.3	176.3	122.7
2002E	9,372.1	178.9	105.4
Forecast			
2003	9,629.3	182.9	102.5
2004	9,972.1	186.6	95.0
2005	10,326.7	190.5	96.4
2006	10,673.2	194.6	97.9
2007	11,016.7	198.9	99.5
2008	11,359.0	203.3	101.3
2009	11,711.1	208.0	103.1
2010	12,074.1	212.8	104.9
2011	12,448.4	217.7	106.7
2012	12,834.4	222.7	108.6
2013	13,232.6	227.8	110.5
2014	13,642.7	233.1	112.5

Source: 2002-2013; Office of Management and Budget, December 2002. Extrapolated to 2014.

TABLE 3

ALTERNATIVE U.S. LONG-TERM ECONOMIC FORECASTS

CALENDAR YEAR	GROSS DOMESTIC PRODUCT (Billions 1996$)		CONSUMER PRICE INDEX (1982-84 = 100)		OIL AND GAS PRICE INDEX (1996 = 100)	
	CBO (FY)	Global Insight (FY)	CBO (FY)	Global Insight (FY)	CBO (FY)*	Global Insight (FY)
Historical						
1997	8,074.1	8,074.1	159.8	159.8	101.0	100.7
1998	8,410.2	8,410.2	162.4	162.4	91.1	90.8
1999	8,765.9	8,765.9	165.5	165.5	89.7	89.7
2000	9,140.5	9,140.5	170.8	170.8	116.6	116.3
2001	9,213.3	9,213.3	176.3	176.3	124.0	122.8
2002E	9,367.4	9,372.1	178.9	178.9	106.5	105.4
Forecast						
2003	9,540.5	9,618.4	183.0	183.1	118.1	114.1
2004	9,904.4	10,033.7	186.9	187.5	121.0	111.1
2005	10,274.5	10,426.1	191.3	192.1	124.4	110.6
2006	10,604.6	10,786.4	196.0	196.3	127.9	113.5
2007	10,944.8	11,118.0	200.9	200.4	131.4	116.6
2008	11,294.0	11,462.1	205.9	204.7	135.1	118.9
2009	11,648.4	11,816.4	211.1	209.1	138.8	120.9
2010	12,005.2	12,213.9	216.4	213.5	142.7	123.3
2011	12,363.4	12,622.7	221.8	218.2	146.7	126.5
2012	12,724.7	13,023.0	227.3	222.9	150.8	129.3
2013	13,088.7	13,438.4	233.0	228.5	155.0	133.5
2014	13,457.4	13,863.8	238.8	235.6	159.3	138.1

Source: Global Insight, November 2002; Congressional Budget Office, November 2002.
*Energy Deflator

TABLE 4

INTERNATIONAL GDP FORECASTS

CALENDAR YEAR	GROSS DOMESTIC PRODUCT (In Billions of 2000 U.S. Dollars)				
	CANADA	EUROPE/ AFRICA/ MIDDLE EAST	LATIN AMERICA/ MEXICO	JAPAN/PACIFIC BASIN/CHINA/OTHER ASIA/AUSTRALIA/ N. ZEALAND	WORLD
Historical					
1997	625.2	9,177.2	1,712.5	7,690.4	28,574.4
1998	650.8	9,431.6	1,753.6	7,689.1	29,273.6
1999	685.9	9,667.2	1,754.9	7,911.1	30,171.2
2000	717.0	10,025.2	1,824.5	8,233.9	31,350.2
2001	727.7	10,176.3	1,825.3	8,378.7	31,716.7
2002E	751.7	10,303.5	1,798.8	8,562.1	32,293.1
Forecast					
2003	777.0	10,511.2	1,838.1	8,872.0	33,200.9
2004	806.0	10,819.4	1,906.8	9,197.8	34,434.0
2005	830.6	11,136.6	1,982.2	9,552.7	35,644.2
2006	855.5	11,448.1	2,063.5	9,914.4	36,846.3
2007	881.1	11,766.4	2,150.0	10,271.0	38,030.1
2008	907.2	12,096.4	2,240.6	10,639.6	39,262.3
2009	933.7	12,427.0	2,336.2	11,023.7	40,532.8
2010	960.7	12,768.4	2,435.3	11,430.2	41,898.5
2011	988.2	13,111.3	2,538.8	11,846.4	43,270.6
2012	1,015.4	13,464.3	2,647.5	12,273.5	44,669.0
2013	1,042.7	13,826.1	2,761.3	12,701.6	46,118.3
2014	1,070.3	14,195.0	2,881.3	13,142.7	47,615.7

Source: Global Insight, World Economic Outlook, December 2002.

TABLE 5

INTERNATIONAL EXCHANGE RATE FORECASTS

CALENDAR YEAR	FOREIGN EXCHANGE RATES (US$/Local Currency, Average)				UNITED STATES OECD TRADE-WEIGHTED NOMINAL EXCHANGE RATE (1990 EQUALS 100)
	CANADA	UNITED KINGDOM	JAPAN*	EURO	
Historical					
1997	0.722	1.637	8.265	1.133	109.1
1998	0.674	1.658	7.639	1.119	115.2
1999	0.673	1.618	8.797	1.066	113.4
2000	0.673	1.513	9.277	0.921	118.3
2001	0.646	1.441	8.229	0.895	126.4
2002E	0.636	1.502	7.979	0.939	125.1
Forecast					
2003	0.666	1.600	8.199	0.980	118.8
2004	0.703	1.621	8.442	1.047	114.5
2005	0.710	1.653	8.680	1.097	111.9
2006	0.717	1.678	8.893	1.131	109.8
2007	0.724	1.675	9.088	1.148	108.3
2008	0.731	1.669	9.281	1.150	107.5
2009	0.738	1.667	9.458	1.150	106.7
2010	0.746	1.667	9.604	1.150	106.0
2011	0.753	1.667	9.726	1.150	105.3
2012	0.760	1.667	9.818	1.150	104.8
2013	0.768	1.667	9.888	1.150	104.3
2014	0.775	1.667	9.942	1.150	103.8

Source: Global Insight, World Economic Outlook, December 2002.
* U.S.$ per 1,000 Yen.

TABLE 6

U.S. LARGE AIR CARRIER FORECAST ASSUMPTIONS

TOTAL SYSTEM OPERATIONS

FISCAL YEAR	AVERAGE SEATS PER AIRCRAFT (Seats)	AVERAGE PASSENGER TRIP LENGTH (Miles)	REVENUE PER PASSENGER MILE		AVERAGE JET FUEL PRICE	
			CURRENT $ (Cents)	FY 2002 $ (Cents)	CURRENT $ (Cents)	FY 2002 $ (Cents)
Historical*						
1997	166.4	1,046.0	12.74	14.26	67.15	75.13
1998	165.7	1,053.5	12.90	14.20	54.67	60.17
1999	165.1	1,072.3	12.58	13.59	49.69	53.67
2000	164.5	1,091.4	13.07	13.68	73.57	77.03
2001	162.8	1,110.4	12.68	12.87	83.37	84.62
2002E	162.2	1,119.9	11.32	11.32	68.28	68.28
Forecast						
2003	163.3	1,128.6	11.66	11.40	70.68	69.13
2004	164.1	1,118.0	12.18	11.67	67.17	64.39
2005	165.4	1,122.4	12.43	11.67	67.48	63.36
2006	166.6	1,126.0	12.57	11.55	68.27	62.75
2007	167.8	1,132.2	12.68	11.41	69.18	62.22
2008	168.9	1,137.5	12.79	11.26	70.16	61.73
2009	170.1	1,142.5	12.92	11.11	71.18	61.22
2010	171.3	1,147.1	13.05	10.97	72.21	60.70
2011	172.5	1,151.0	13.18	10.83	73.25	60.19
2012	173.6	1,154.4	13.31	10.69	74.34	59.71
2013	174.7	1,157.2	13.45	10.56	75.42	59.21
2014	175.8	1,159.5	13.59	10.43	76.50	58.72

* Source: Form 41, U.S. Department of Transportation.

TABLE 7

U.S. LARGE AIR CARRIER FORECAST ASSUMPTIONS

DOMESTIC OPERATIONS

FISCAL YEAR	AVERAGE SEATS PER AIRCRAFT (Seats)	AVERAGE PASSENGER TRIP LENGTH (Miles)	REVENUE PER PASSENGER MILE		AVERAGE JET FUEL PRICE	
			CURRENT $ (Cents)	FY 2002 $ (Cents)	CURRENT $ (Cents)	FY 2002 $ (Cents)
Historical*						
1997	149.8	842.9	13.39	14.98	65.7	73.5
1998	149.6	847.5	13.79	15.18	53.5	58.9
1999	149.8	861.1	13.53	14.61	48.5	52.4
2000	148.8	872.6	14.04	14.70	71.5	74.9
2001	147.1	885.5	13.55	13.76	82.4	83.6
2002E	147.9	907.5	11.87	11.87	67.0	67.0
Forecast						
2003	148.4	913.6	12.26	11.99	69.3	67.8
2004	149.2	906.0	12.91	12.38	65.9	63.1
2005	150.2	906.0	13.23	12.42	66.2	62.1
2006	151.2	905.5	13.38	12.30	67.0	61.5
2007	152.2	907.5	13.49	12.13	67.8	61.0
2008	153.2	908.8	13.59	11.96	68.8	60.5
2009	154.2	910.0	13.71	11.79	69.8	60.0
2010	155.2	911.1	13.82	11.62	70.8	59.5
2011	156.2	911.9	13.94	11.45	71.8	59.0
2012	157.2	912.7	14.06	11.29	72.9	58.6
2013	158.2	913.3	14.18	11.13	74.0	58.1
2014	159.2	913.8	14.30	10.98	75.0	57.6

* Source: Form 41, U.S. Department of Transportation.

TABLE 8

U.S. LARGE AIR CARRIER FORECAST ASSUMPTIONS

INTERNATIONAL OPERATIONS (PART 1)

FISCAL YEAR	AVERAGE SEATS PER AIRCRAFT (Seats)	AVERAGE PASSENGER TRIP LENGTH (Miles)	REVENUE PER PASSENGER MILE		AVERAGE JET FUEL PRICE	
			CURRENT $ (Cents)	FY 2002 $ (Cents)	CURRENT $ (Cents)	FY 2002 $ (Cents)
Historical*						
1997	246.7	3,081.9	10.98	12.29	71.2	79.7
1998	237.8	3,126.7	10.49	11.54	57.9	63.7
1999	234.2	3,253.6	9.99	10.79	52.9	57.1
2000	236.6	3,397.1	10.45	10.95	79.4	83.1
2001	233.6	3,404.8	10.38	10.53	86.1	87.4
2002E	228.5	3,278.1	9.77	9.77	71.7	71.7
Forecast						
2003	229.9	3,243.8	10.00	9.78	74.2	72.6
2004	231.5	3,263.2	10.12	9.70	70.5	67.6
2005	232.7	3,270.4	10.25	9.62	70.9	66.5
2006	233.3	3,276.8	10.38	9.54	71.7	65.9
2007	233.9	3,286.4	10.54	9.48	72.7	65.3
2008	234.0	3,294.2	10.72	9.43	73.7	64.8
2009	234.5	3,302.2	10.90	9.37	74.8	64.3
2010	234.9	3,308.6	11.09	9.32	75.8	63.8
2011	235.3	3,315.0	11.28	9.27	76.9	63.2
2012	235.8	3,319.5	11.47	9.22	78.1	62.7
2013	236.1	3,324.7	11.67	9.16	79.2	62.2
2014	236.4	3,329.7	11.87	9.11	80.3	61.7

* Source: Form 41, U.S. Department of Transportation.

TABLE 9

U.S. LARGE AIR CARRIER AND REGIONAL/COMMUTER FORECAST ASSUMPTIONS

INTERNATIONAL OPERATIONS (PART 2)

FISCAL YEAR	AVERAGE SEATS PER AIRCRAFT				
	ATLANTIC	LATIN AMERICA			PACIFIC
		AIR CARRIER	REGIONAL	TOTAL	
	(Seats)	(Seats)	(Seats)	(Seats)	(Seats)
Historical*					
1997	231.9	184.3	28.9	169.1	329.1
1998	228.4	181.3	34.2	170.0	318.2
1999	229.6	180.9	42.2	169.6	303.8
2000	233.7	179.5	42.1	165.7	307.8
2001	232.6	174.6	44.5	160.1	304.1
2002E	233.9	172.8	41.8	158.3	294.6
Forecast					
2003	235.9	173.5	43.3	158.5	294.5
2004	238.4	174.0	43.8	158.5	294.7
2005	239.9	174.5	44.3	159.4	295.5
2006	240.9	175.0	44.8	160.2	296.0
2007	241.7	175.5	45.3	160.9	296.3
2008	241.9	176.0	45.8	161.7	296.3
2009	242.4	176.5	46.3	162.5	297.0
2010	242.9	177.0	46.8	163.3	297.8
2011	243.4	177.5	47.3	164.1	298.5
2012	243.9	178.0	47.8	164.9	300.0
2013	244.4	178.5	48.3	165.7	300.3
2014	244.9	179.0	48.8	166.4	300.5

* Source: Form 41, U.S. Department of Transportation.

TABLE 10

U.S. LARGE AIR CARRIER AND REGIONAL/COMMUTER FORECAST ASSUMPTIONS

INTERNATIONAL OPERATIONS (PART3)

FISCAL YEAR	AVERAGE PASSENGER TRIP LENGTH				
	ATLANTIC	LATIN AMERICA			PACIFIC
		AIR CARRIER	REGIONAL	TOTAL	
	(Miles)	(Miles)	(Miles)	(Miles)	(Miles)
Historical*					
1997	4,130.1	1,524.7	222.0	1,395.5	3,878.1
1998	4,135.4	1,586.7	238.4	1,458.2	4,023.6
1999	4,161.9	1,634.3	240.6	1,466.0	4,563.4
2000	4,168.1	1,675.0	261.0	1,492.9	5,219.9
2001	4,211.8	1,687.9	319.1	1,514.9	5,228.8
2002E	4,168.7	1,619.2	344.2	1,473.0	5,303.7
Forecast					
2003	4,176.7	1,581.2	347.2	1,430.8	5,278.3
2004	4,209.6	1,593.6	351.1	1,434.3	5,335.8
2005	4,226.8	1,587.1	357.0	1,430.6	5,340.8
2006	4,240.9	1,591.9	362.5	1,436.9	5,345.9
2007	4,252.7	1,604.2	366.3	1,449.1	5,347.9
2008	4,265.2	1,616.1	369.7	1,461.2	5,348.4
2009	4,278.3	1,628.4	373.1	1,473.8	5,351.5
2010	4,291.4	1,639.5	376.4	1,485.5	5,354.6
2011	4,301.7	1,652.1	379.7	1,498.4	5,356.1
2012	4,310.3	1,663.1	383.0	1,510.0	5,357.6
2013	4,321.9	1,674.1	386.1	1,521.4	5,359.2
2014	4,332.3	1,684.7	389.5	1,532.6	5,361.7

* Source: Form 41, U.S. Department of Transportation.

TABLE 11

U.S. LARGE AIR CARRIER FORECAST ASSUMPTIONS

INTERNATIONAL OPERATIONS (PART 4)

FISCAL YEAR	REVENUE PER PASSENGER MILE					
	ATLANTIC		LATIN AMERICA 1/		PACIFIC	
	CURRENT $ (Cents)	FY 2002 $ (Cents)	CURRENT $ (Cents)	FY 2002 $ (Cents)	CURRENT $ (Cents)	FY 2002 $ (Cents)
Historical*						
1997	10.31	11.54	13.91	15.56	10.33	11.56
1998	10.13	11.15	13.53	14.89	9.25	10.18
1999	9.61	10.38	12.54	13.54	9.00	9.72
2000	9.73	10.19	13.00	13.61	9.99	10.46
2001	9.71	9.86	13.57	13.77	9.38	9.52
2002E	9.29	9.29	12.44	12.44	8.66	8.66
Forecast						
2003	9.56	9.35	12.72	12.44	8.78	8.59
2004	9.62	9.22	12.97	12.43	8.88	8.51
2005	9.73	9.13	13.17	12.37	9.02	8.47
2006	9.84	9.04	13.38	12.30	9.12	8.39
2007	10.00	9.00	13.61	12.24	9.23	8.30
2008	10.17	8.95	13.85	12.18	9.34	8.22
2009	10.36	8.91	14.09	12.12	9.46	8.14
2010	10.54	8.86	14.34	12.06	9.58	8.06
2011	10.73	8.82	14.60	12.00	9.70	7.98
2012	10.92	8.77	14.86	11.94	9.83	7.90
2013	11.12	8.73	15.13	11.88	9.95	7.82
2014	11.32	8.69	15.40	11.82	10.08	7.74

1/ Air Carrier Only

* Source: Form 41, U.S. Department of Transportation.

TABLE 12

U.S. AND FOREIGN FLAG CARRIERS

TOTAL PASSENGER TRAFFIC TO/FROM THE UNITED STATES

CALENDAR YEAR	TOTAL PASSENGERS BY WORLD TRAVEL AREA (Millions)				
	ATLANTIC	LATIN AMERICA	PACIFIC	U.S./CANADA TRANSBORDER	TOTAL
Historical*					
1997	43.7	35.9	24.5	18.1	122.2
1998	46.6	37.7	22.9	19.0	126.1
1999	48.7	38.8	24.3	19.6	131.4
2000	53.0	40.8	26.0	20.8	140.5
2001	47.5	38.8	23.0	19.4	128.7
2002E	43.3	38.3	22.4	17.9	122.0
Forecast					
2003	45.5	39.9	23.4	18.9	127.7
2004	48.2	41.6	24.3	19.8	133.8
2005	50.7	43.9	25.8	20.4	140.8
2006	53.3	46.3	27.2	21.0	147.8
2007	55.8	48.6	28.7	21.6	154.7
2008	58.4	51.1	30.1	22.2	161.9
2009	61.1	53.8	31.6	22.9	169.4
2010	63.8	56.6	33.2	23.5	177.2
2011	66.6	59.5	34.8	24.2	185.1
2012	69.5	62.5	36.5	24.9	193.3
2013	72.4	65.6	38.2	25.6	201.7
2014	75.4	68.8	39.9	26.3	210.4

* Sources: Atlantic, Pacific, and Latin America, INS Form I-92, U.S. Department of Commerce; U.S./ Canada Transborder, Transport Canada.

TABLE 13

U.S. LARGE AIR CARRIERS AND REGIONALS/COMMUTERS

TOTAL SCHEDULED U.S. PASSENGER TRAFFIC

FISCAL YEAR	REVENUE PASSENGER ENPLANEMENTS (Millions)			REVENUE PASSENGER MILES (Billions)		
	DOMESTIC	INTERNATIONAL	TOTAL	DOMESTIC	INTERNATIONAL	TOTAL
Historical*						
1997	577.8	53.6	631.4	448.9	159.0	607.9
1998	590.4	54.2	644.7	460.7	163.5	624.2
1999	610.9	54.9	665.8	482.4	170.1	652.4
2000	639.8	56.4	696.3	512.3	181.8	694.1
2001	626.7	56.7	683.4	508.0	183.3	691.3
2002E	576.8	50.8	627.6	473.4	158.7	632.1
Forecast						
2003	593.1	53.8	646.9	489.3	165.6	654.9
2004	624.9	55.0	679.8	511.0	169.5	680.5
2005	651.1	58.0	709.1	531.6	179.3	710.9
2006	676.6	61.0	737.6	551.7	189.2	740.9
2007	700.9	64.0	765.0	572.1	199.3	771.4
2008	726.0	67.2	793.2	593.0	209.7	802.7
2009	752.3	70.5	822.8	615.2	220.6	835.8
2010	780.1	73.9	854.0	638.6	232.0	870.5
2011	809.4	77.4	886.8	663.3	243.5	906.8
2012	840.3	81.1	921.3	689.5	255.4	944.9
2013	873.0	84.8	957.8	717.2	267.7	985.0
2014	907.5	88.6	996.2	746.6	280.3	1,027.0

* Source: Forms 41 and 298-C, U.S. Department of Transportation.

TABLE 14

U. S. LARGE AIR CARRIERS

SCHEDULED PASSENGER TRAFFIC

FISCAL YEAR	REVENUE PASSENGER ENPLANEMENTS (Millions)			REVENUE PASSENGER MILES (Billions)		
	DOMESTIC	INTERNATIONAL	TOTAL	DOMESTIC	INTERNATIONAL	TOTAL
Historical*						
1997	515.7	51.4	567.1	434.6	158.6	593.2
1998	524.7	52.1	576.8	444.7	163.0	607.7
1999	537.8	52.1	589.9	463.1	169.4	632.5
2000	561.5	53.3	614.8	490.0	181.0	670.9
2001	546.3	53.5	599.9	483.8	182.3	666.1
2002E	488.8	48.1	536.9	443.6	157.7	601.3
Forecast						
2003	498.8	50.7	549.5	455.6	164.5	620.1
2004	522.1	51.6	573.7	473.0	168.3	641.4
2005	540.4	54.4	594.8	489.6	178.1	667.6
2006	559.4	57.3	616.7	506.5	187.9	694.4
2007	577.3	60.2	637.5	523.9	197.9	721.8
2008	596.1	63.2	659.3	541.7	208.2	750.0
2009	616.1	66.3	682.5	560.7	219.0	779.7
2010	637.5	69.6	707.1	580.8	230.3	811.1
2011	660.3	72.9	733.3	602.2	241.8	844.0
2012	684.6	76.4	761.1	624.9	253.7	878.5
2013	710.7	80.0	790.6	649.1	265.9	914.9
2014	738.4	83.6	822.1	674.8	278.4	953.2

* Source: Form 41, U.S. Department of Transportation.

TABLE 15

U.S. LARGE AIR CARRIERS AND REGIONALS/COMMUTERS

SCHEDULED INTERNATIONAL PASSENGER ENPLANEMENTS

FISCAL YEAR	REVENUE PASSENGER ENPLANEMENTS (MIL)					
	ATLANTIC	LATIN AMERICA			PACIFIC	TOTAL
		AIR CARRIER	REGIONALS	TOTAL		
Historical*						
1997	16.5	19.2	2.1	21.3	15.8	53.6
1998	18.0	20.0	2.1	22.1	14.1	54.2
1999	19.1	20.7	2.8	23.5	12.3	54.9
2000	20.9	21.2	3.1	24.3	11.2	56.4
2001	20.5	21.7	3.1	24.8	11.4	56.7
2002E	18.0	20.9	2.7	23.6	9.2	50.8
Forecast						
2003	18.7	22.3	3.1	25.4	9.7	53.8
2004	19.0	22.9	3.4	26.2	9.7	55.0
2005	20.0	24.1	3.5	27.6	10.3	58.0
2006	21.0	25.4	3.7	29.1	10.9	61.0
2007	22.0	26.7	3.8	30.5	11.5	64.0
2008	23.0	28.1	4.0	32.1	12.1	67.2
2009	24.1	29.6	4.2	33.7	12.7	70.5
2010	25.2	31.1	4.3	35.5	13.3	73.9
2011	26.3	32.7	4.5	37.2	14.0	77.4
2012	27.4	34.4	4.7	39.1	14.6	81.1
2013	28.6	36.1	4.9	41.0	15.3	84.8
2014	29.7	37.9	5.0	42.9	16.0	88.6

* Source: Form 41, U.S. Department of Transportation.
Note: Detail may not add to total because of rounding.

TABLE 16

U.S. LARGE AIR CARRIERS AND REGIONALS/COMMUTERS

SCHEDULED INTERNATIONAL REVENUE PASSENGER MILES

FISCAL YEAR	REVENUE PASSENGER MILES (BIL)					
		LATIN AMERICA				
	ATLANTIC	AIR CARRIER	REGIONALS	TOTAL	PACIFIC	TOTAL INTERNATIONAL
Historical*						
1997	68.2	29.2	0.5	29.7	61.1	159.0
1998	74.6	31.8	0.5	32.3	56.7	163.5
1999	79.6	33.8	0.7	34.4	56.1	170.1
2000	87.1	35.5	0.8	36.3	58.4	181.8
2001	86.2	36.6	1.0	37.6	59.4	183.3
2002E	74.8	33.9	0.9	34.8	49.0	158.7
Forecast						
2003	78.2	35.3	1.1	36.4	51.0	165.6
2004	79.9	36.4	1.2	37.6	52.0	169.5
2005	84.6	38.2	1.3	39.5	55.3	179.3
2006	89.1	40.5	1.3	41.8	58.3	189.2
2007	93.6	42.9	1.4	44.3	61.4	199.3
2008	98.3	45.4	1.5	46.9	64.5	209.7
2009	103.1	48.1	1.5	49.7	67.8	220.6
2010	108.0	51.0	1.6	52.7	71.2	232.0
2011	113.0	54.1	1.7	55.8	74.8	243.5
2012	118.1	57.2	1.8	59.0	78.4	255.4
2013	123.4	60.4	1.9	62.3	82.0	267.7
2014	128.8	63.8	2.0	65.8	85.7	280.3

* Source: Form 41, U.S. Department of Transportation.
Note: Detail may not add to total because of rounding.

TABLE 17

U.S. LARGE AIR CARRIERS

SCHEDULED PASSENGER CAPACITY, TRAFFIC, AND LOAD FACTORS

FISCAL YEAR	DOMESTIC			INTERNATIONAL		
	ASMs (BIL)	RPMs (BIL)	% LOAD FACTOR	ASMs (BIL)	RPMs (BIL)	% LOAD FACTOR
Historical*						
1997	628.6	434.6	69.1	213.4	158.6	74.3
1998	631.9	444.7	70.4	222.9	163.0	73.1
1999	661.4	463.1	70.0	229.0	169.4	74.0
2000	688.3	490.0	71.2	238.0	181.0	76.0
2001	691.1	483.8	70.0	244.9	182.3	74.4
2002E	633.3	443.6	70.0	211.4	157.7	74.6
Forecast						
2003	628.5	455.6	72.5	218.0	164.5	75.4
2004	649.3	473.0	72.9	222.6	168.3	75.6
2005	672.2	489.6	72.8	234.9	178.1	75.8
2006	692.5	506.5	73.1	246.5	187.9	76.2
2007	713.7	523.9	73.4	258.6	197.9	76.5
2008	735.0	541.7	73.7	271.2	208.2	76.8
2009	757.6	560.7	74.0	285.2	219.0	76.8
2010	781.5	580.8	74.3	299.9	230.3	76.8
2011	806.8	602.2	74.6	314.9	241.8	76.8
2012	833.6	624.9	75.0	330.4	253.7	76.8
2013	862.1	649.1	75.3	346.4	265.9	76.7
2014	893.6	674.8	75.5	362.8	278.4	76.7

* Source: Form 41, U.S. Department of Transportation.

TABLE 18

U.S. LARGE AIR CARRIERS

SCHEDULED PASSENGER CAPACITY, TRAFFIC, AND LOAD FACTORS BY INTERNATIONAL TRAVEL REGIONS

FISCAL YEAR	ATLANTIC			LATIN AMERICA			PACIFIC		
	ASMs (BIL)	RPMs (BIL)	% LOAD FACTOR	ASMs (BIL)	RPMs (BIL)	% LOAD FACTOR	ASMs (BIL)	RPMs (BIL)	% LOAD FACTOR
Historical*									
1997	86.7	68.2	78.7	44.5	29.2	65.8	82.3	61.1	74.3
1998	94.6	74.6	78.9	50.5	31.8	62.9	77.9	56.7	72.8
1999	102.6	79.6	77.5	51.2	33.8	66.0	75.2	56.1	74.5
2000	109.9	87.1	79.2	51.4	35.5	69.0	76.6	58.4	76.2
2001	112.9	86.2	76.4	52.9	36.6	69.2	79.1	59.4	75.2
2002E	97.2	74.8	77.0	50.9	33.9	66.5	63.3	49.0	77.5
Forecast									
2003	100.5	78.2	77.8	52.0	35.3	67.9	65.5	51.0	77.8
2004	101.9	79.9	78.4	53.0	36.4	68.8	67.7	52.0	76.8
2005	107.7	84.6	78.5	55.4	38.2	69.0	71.8	55.3	77.0
2006	112.7	89.1	79.0	58.4	40.5	69.3	75.3	58.3	77.5
2007	117.7	93.6	79.5	61.7	42.9	69.5	79.2	61.4	77.5
2008	122.9	98.3	80.0	65.1	45.4	69.8	83.3	64.5	77.5
2009	128.9	103.1	80.0	68.8	48.1	70.0	87.5	67.8	77.5
2010	135.1	108.0	80.0	72.9	51.0	70.0	91.9	71.2	77.5
2011	141.3	113.0	80.0	77.2	54.1	70.0	96.5	74.8	77.5
2012	147.6	118.1	80.0	81.7	57.2	70.0	101.1	78.4	77.5
2013	154.3	123.4	80.0	86.4	60.4	70.0	105.8	82.0	77.5
2014	161.1	128.8	80.0	91.2	63.8	70.0	110.6	85.7	77.5

* Source: Form 41, U.S. Department of Transportation.

TABLE 19

U.S. LARGE AIR CARRIERS

AIR CARGO REVENUE TON MILES 1/

FISCAL YEAR	ALL-CARGO CARRIER RTMS (Millions)			PASSENGER CARRIER RTMS (Millions)		
	DOMESTIC	INTERNATIONAL	TOTAL	DOMESTIC	INTERNATIONAL	TOTAL
Historical*						
1997	8,799.7	7,359.9	16,159.6	4,654.4	6,138.3	10,792.7
1998	9,351.4	8,025.3	17,376.7	4,476.7	6,496.9	10,973.6
1999	9,756.7	7,328.1	17,084.8	4,218.2	6,798.8	11,017.0
2000	10,283.5	7,568.2	17,851.7	4,415.3	7,789.6	12,204.9
2001	9,992.3	7,370.4	17,362.7	3,941.7	7,176.6	11,118.3
2002E	9,708.2	7,627.0	17,335.2	3,406.5	6,604.5	10,011.0
Forecast						
2003	10,285.8	8,046.8	18,332.6	3,483.7	6,799.7	10,283.4
2004	10,746.8	8,521.4	19,268.2	3,563.2	7,137.7	10,700.9
2005	11,187.2	9,134.8	20,322.0	3,646.0	7,584.4	11,230.4
2006	11,710.2	9,771.6	21,481.8	3,750.9	8,042.0	11,792.9
2007	12,233.2	10,427.9	22,661.1	3,850.4	8,506.9	12,357.3
2008	12,758.4	11,114.6	23,873.0	3,945.4	8,987.5	12,932.9
2009	13,301.2	11,836.6	25,137.8	4,040.7	9,487.1	13,527.8
2010	13,863.2	12,614.3	26,477.5	4,136.3	10,021.5	14,157.8
2011	14,445.5	13,390.6	27,836.1	4,232.4	10,544.5	14,776.9
2012	15,048.5	14,210.1	29,258.6	4,328.9	11,091.2	15,420.1
2013	15,673.2	15,045.5	30,718.7	4,425.8	11,639.6	16,065.4
2014	16,320.0	15,912.3	32,232.3	4,522.9	12,201.3	16,724.2

* Source: Form 41, U.S. Department of Transportation.
1/ Includes freight/express and mail revenue ton miles.

TABLE 20

U.S. LARGE AIR CARRIERS AND REGIONALS/COMMUTERS

PASSENGER JET AIRCRAFT

CALENDAR YEAR	LARGE NARROWBODY			LARGE WIDEBODY			REGIONAL JETS	TOTAL
	2 ENGINE	3 ENGINE	4 ENGINE	2 ENGINE	3 ENGINE	4 ENGINE		
Historical								
1997	2,824	532	37	288	243	139	108	4,171
1998	2,949	508	32	309	226	122	221	4,367
1999	3,139	436	21	361	204	129	365	4,655
2000	3,362	385	9	424	169	123	542	5,014
2001	3,432	228	11	461	105	98	782	5,117
2002E	3,361	142	16	477	92	92	976	5,156
Forecast								
2003	3,352	126	10	490	64	87	1,233	5,362
2004	3,343	112	0	505	51	82	1,482	5,575
2005	3,402	103	0	541	40	77	1,681	5,844
2006	3,487	103	0	552	38	76	1,890	6,146
2007	3,579	103	0	573	37	77	2,084	6,453
2008	3,656	102	0	593	35	78	2,238	6,702
2009	3,739	102	0	618	34	76	2,369	6,938
2010	3,829	103	0	642	32	77	2,471	7,154
2011	3,933	103	0	668	33	77	2,563	7,377
2012	4,059	103	0	688	33	78	2,654	7,615
2013	4,193	103	0	706	34	78	2,744	7,858
2014	4,323	103	0	723	34	78	2,834	8,095

TABLE 21

U.S. LARGE AIR CARRIERS

CARGO JET AIRCRAFT

CALENDAR YEAR	LARGE NARROWBODY			LARGE WIDEBODY			TOTAL
	2 ENGINE	3 ENGINE	4 ENGINE	2 ENGINE	3 ENGINE	4 ENGINE	
Historical							
1997	160	322	199	86	111	40	918
1998	166	326	197	111	123	44	967
1999	172	338	196	134	147	53	1,040
2000	166	332	176	164	158	68	1,064
2001	163	302	143	183	176	72	1,039
2002E	160	289	128	206	183	68	1,034
Forecast							
2003	159	283	127	221	187	75	1,052
2004	159	279	129	238	195	82	1,082
2005	159	280	131	267	203	87	1,127
2006	159	275	133	301	211	91	1,170
2007	159	270	135	340	219	95	1,218
2008	159	265	135	381	228	102	1,270
2009	159	255	134	420	236	109	1,313
2010	159	255	133	454	245	116	1,362
2011	159	255	132	489	254	122	1,411
2012	159	255	131	523	262	128	1,458
2013	159	255	128	557	271	134	1,504
2014	159	255	125	590	279	139	1,547

TABLE 22

U.S. LARGE AIR CARRIERS

TOTAL AIRBORNE HOURS 1/

(In Thousands)

FISCAL YEAR	LARGE NARROWBODY			LARGE WIDEBODY			TOTAL
	2 ENGINE	3 ENGINE	4 ENGINE	2 ENGINE	3 ENGINE	4 ENGINE	
Historical*							
1997	8,430	1,472	293	1,149	940	530	12,814
1998	8,661	1,477	261	1,285	942	511	13,137
1999	9,195	1,385	249	1,489	908	503	13,728
2000	9,795	1,226	201	1,690	846	501	14,258
2001	10,167	969	186	1,885	669	483	14,358
2002E	9,475	451	108	1,927	532	434	12,927
Forecast							
2003	9,448	407	103	2,026	388	435	12,807
2004	9,706	385	97	2,170	390	452	13,200
2005	10,018	374	99	2,395	389	456	13,731
2006	10,308	365	100	2,554	399	469	14,195
2007	10,621	357	102	2,747	410	479	14,715
2008	10,949	347	102	2,945	421	496	15,259
2009	11,243	334	101	3,139	432	510	15,759
2010	11,560	332	100	3,314	444	532	16,282
2011	11,921	329	99	3,498	446	548	16,841
2012	12,349	325	99	3,662	445	567	17,447
2013	12,805	322	96	3,819	446	584	18,073
2014	13,253	319	94	3,970	454	598	18,688

* Source: Form 41, U.S. Department of Transportation.

1/ Includes both passenger (excluding regional jets) and cargo aircraft.

TABLE 23

TOTAL JET FUEL AND AVIATION GASOLINE FUEL CONSUMPTION

U.S. CIVIL AVIATION AIRCRAFT

(Millions of Gallons)

FISCAL YEAR	JET FUEL					AVIATION GASOLINE			TOTAL FUEL CONSUMED
	U.S. AIR CARRIERS 1/			GENERAL AVIATION	TOTAL	AIR CARRIER	GENERAL AVIATION	TOTAL	
	DOMESTIC	INT'L.	TOTAL						
Historical*									
1997	13,429	4,818	18,247	642	18,889	2	292	294	19,183
1998	13,754	5,129	18,883	815	19,697	2	311	313	20,011
1999	14,243	5,186	19,428	967	20,396	2	345	347	20,743
2000	14,746	5,297	20,043	998	21,041	2	337	339	21,380
2001	14,469	5,395	19,864	939	20,803	2	319	321	21,124
2002E	12,691	4,830	17,521	1,015	18,536	2	319	321	18,857
Forecast									
2003	12,618	5,011	17,629	1,063	18,692	2	322	324	19,016
2004	13,139	5,106	18,245	1,118	19,363	2	327	329	19,692
2005	13,684	5,362	19,046	1,199	20,245	2	332	334	20,579
2006	14,161	5,597	19,758	1,309	21,067	2	337	339	21,406
2007	14,656	5,844	20,500	1,412	21,912	2	342	344	22,256
2008	15,117	6,099	21,215	1,524	22,739	2	347	349	23,088
2009	15,564	6,379	21,943	1,640	23,583	2	352	354	23,937
2010	16,035	6,692	22,727	1,773	24,500	2	356	358	24,858
2011	16,532	7,009	23,541	1,881	25,422	2	361	363	25,785
2012	17,055	7,336	24,391	2,002	26,393	2	366	368	26,761
2013	17,610	7,670	25,280	2,131	27,411	2	370	372	27,783
2014	18,219	8,013	26,232	2,262	28,494	2	375	377	28,871

* Source: Air carrier jet fuel, Form 41, U.S. Department of Transportation; all others, FAA APO estimates.
1/ Includes both passenger and cargo carriers.

TABLE 24

U.S. REGIONALS/COMMUTERS FORECAST ASSUMPTIONS

FISCAL YEAR	AVERAGE SEATS PER AIRCRAFT			AVERAGE PASSENGER TRIP LENGTH			FORM 41 REVENUE PER PASSENGER MILE	
	DOMESTIC (Seats)	INT'L. (Seats)	SYSTEM (Seats)	DOMESTIC (Miles)	INT'L. (Miles)	SYSTEM (Miles)	CURRENT $ (Cents)	2002$ (Cents)
Historical*								
1997	32.1	28.9	32.0	229.6	222.0	229.3	36.40	40.75
1998	34.0	34.2	34.0	244.2	238.4	244.0	34.64	38.16
1999	36.7	42.2	36.8	263.4	240.6	262.6	31.88	34.45
2000	38.9	42.1	39.0	285.8	261.0	284.8	30.42	31.86
2001	40.4	44.5	40.6	301.4	319.1	302.1	29.79	30.23
2002E	42.9	41.8	42.8	339.1	344.2	339.2	26.93	26.93
Forecast								
2003	44.6	43.3	44.6	363.5	347.2	363.0	27.73	27.12
2004	45.4	43.8	45.4	375.5	351.1	374.7	29.20	27.99
2005	45.9	44.3	45.9	385.9	357.0	385.0	29.90	28.08
2006	46.4	44.8	46.4	391.8	362.5	390.9	30.23	27.79
2007	46.9	45.3	46.9	396.8	366.3	395.9	30.47	27.41
2008	47.4	45.8	47.4	402.0	369.7	401.1	30.72	27.02
2009	47.9	46.3	47.9	407.3	373.1	406.3	30.96	26.63
2010	48.4	46.8	48.4	412.4	376.4	411.3	31.21	26.24
2011	48.9	47.3	48.9	417.6	379.7	416.5	31.46	25.85
2012	49.4	47.8	49.4	422.8	383.0	421.6	31.71	25.47
2013	49.9	48.3	49.9	427.8	386.1	426.6	31.97	25.10
2014	50.4	48.8	50.4	432.9	389.5	431.6	32.22	24.73

* Source: Forms 298-C and 41, U.S. Department of Transportation.

TABLE 25

U.S. REGIONALS/COMMUTERS

SCHEDULED PASSENGER TRAFFIC

(In Millions)

FISCAL YEAR	REVENUE PASSENGERS			REVENUE PASSENGER MILES		
	DOMESTIC	INTERNATIONAL	SYSTEM	DOMESTIC	INTERNATIONAL	SYSTEM
Historical*						
1997	62.2	2.1	64.3	14,276.2	468.9	14,745.1
1998	65.7	2.1	67.8	16,047.2	502.9	16,550.1
1999	73.1	2.8	76.0	19,264.9	682.6	19,947.5
2000	78.4	3.1	81.5	22,391.9	817.8	23,209.7
2001	80.4	3.1	83.6	24,244.0	1,001.5	25,245.5
2002E	88.0	2.7	90.7	29,836.1	932.3	30,768.4
Forecast						
2003	94.0	3.1	97.1	34,175.9	1,076.0	35,251.9
2004	103.2	3.4	106.6	38,754.3	1,180.7	39,935.0
2005	110.5	3.5	114.0	42,629.8	1,254.1	43,883.9
2006	116.9	3.7	120.6	45,793.9	1,329.2	47,123.1
2007	123.3	3.8	127.1	48,931.0	1,401.0	50,332.0
2008	129.5	4.0	133.5	52,057.2	1,474.0	53,531.2
2009	135.7	4.2	139.9	55,272.9	1,549.3	56,822.2
2010	142.1	4.3	146.4	58,587.2	1,626.8	60,214.0
2011	148.5	4.5	153.0	62,006.5	1,706.8	63,713.3
2012	155.0	4.7	159.7	65,531.8	1,789.3	67,321.1
2013	161.9	4.9	166.7	69,251.5	1,874.3	71,125.8
2014	169.0	5.0	174.0	73,164.9	1,962.9	75,127.8

* Source: Forms 298-C and 41, U.S. Department of Transportation.

TABLE 26

U.S. REGIONALS/COMMUTERS

SCHEDULED PASSENGER CAPACITY, TRAFFIC, AND LOAD FACTORS

FISCAL YEAR	DOMESTIC			INTERNATIONAL		
	ASMs (MIL)	RPMs (MIL)	% LOAD FACTOR	ASMs (MIL)	RPMs (MIL)	% LOAD FACTOR
Historical*						
1997	26,570.5	14,276.2	53.7	757.1	468.9	61.9
1998	28,428.6	16,047.2	56.4	793.7	502.9	63.4
1999	33,345.6	19,264.9	57.8	1,054.8	682.6	64.7
2000	38,332.4	22,391.9	58.4	1,347.4	817.8	60.7
2001	41,357.0	24,244.0	58.6	1,694.0	1,001.5	59.1
2002E	48,681.7	29,836.1	61.3	1,532.4	932.3	60.8
Forecast						
2003	56,649.1	34,175.9	60.3	1,794.0	1,076.0	60.0
2004	64,806.6	38,754.3	59.8	1,967.8	1,180.7	60.0
2005	71,888.4	42,629.8	59.3	2,073.0	1,254.1	60.5
2006	77,880.8	45,793.9	58.8	2,179.1	1,329.2	61.0
2007	83,929.7	48,931.0	58.3	2,278.1	1,401.0	61.5
2008	89,291.9	52,057.2	58.3	2,377.5	1,474.0	62.0
2009	93,682.9	55,272.9	59.0	2,478.8	1,549.3	62.5
2010	97,645.4	58,587.2	60.0	2,582.3	1,626.8	63.0
2011	101,650.1	62,006.5	61.0	2,687.9	1,706.8	63.5
2012	105,696.5	65,531.8	62.0	2,795.8	1,789.3	64.0
2013	109,923.0	69,251.5	63.0	2,906.0	1,874.3	64.5
2014	114,320.0	73,164.9	64.0	3,019.8	1,962.9	65.0

* Source: Form 41, and Form 298C, U.S. Department of Transportation.

TABLE 27

U.S. REGIONALS/COMMUTERS

PASSENGER AIRCRAFT

AS OF JANUARY 1	REGIONAL/COMMUTER AIRCRAFT									TOTAL FLEET
	LESS THAN 9 SEATS	10 TO 19 SEATS	20 TO 30 SEATS	31 TO 40 SEATS			OVER 40 SEATS			
				PROP	JET	TOTAL	PROP	JET	TOTAL	
Historical*										
1997R	540	484	321	429		429	167	132	299	2,073
1998	526	419	294	483		483	172	240	412	2,134
1999	452	401	279	485	22	507	169	370	539	2,178
2000	470	343	262	474	74	548	155	496	651	2,274
2001	490	250	248	445	110	555	148	672	820	2,363
2002E	490	244	223	404	118	522	128	914	1,042	2,521
Forecast										
2003	485	229	203	374	130	504	124	1,159	1,283	2,704
2004	480	214	183	344	134	478	120	1,404	1,524	2,884
2005	475	199	173	314	134	448	116	1,603	1,719	3,019
2006	470	184	163	284	134	418	112	1,812	1,924	3,159
2007	465	174	158	264	134	398	110	2,006	2,116	3,311
2008	460	169	153	250	134	384	108	2,160	2,268	3,434
2009	455	169	153	245	134	379	108	2,291	2,399	3,555
2010	455	169	153	240	134	374	108	2,393	2,501	3,652
2011	455	169	153	240	134	374	112	2,485	2,597	3,748
2012	455	169	153	240	134	374	117	2,576	2,693	3,844
2013	455	169	153	240	134	374	122	2,666	2,788	3,939
2014	455	169	153	240	134	374	127	2,756	2,883	4,034

* Source: Back Aviation Solutions.

TABLE 28

U.S. REGIONALS/COMMUTERS

BLOCK HOURS FLOWN

(In Thousands)

AS OF JANUARY 1	REGIONAL/COMMUTER AIRCRAFT									TOTAL FLEET
	LESS THAN 9 SEATS	10 TO 19 SEATS	20 TO 30 SEATS	31 TO 40 SEATS			OVER 40 SEATS			
				PROP	JET	TOTAL	PROP	JET	TOTAL	
Historical*										
1997R	447	1,196	922	1,152		1,152	433	316	749	4,464
1998	435	1,035	844	1,297	0	1,297	446	574	1,020	4,631
1999	364	1,024	841	1,402	9	1,411	416	1,000	1,416	5,056
2000	384	852	782	1,447	121	1,568	392	1,381	1,773	5,359
2001	397	609	675	1,201	268	1,469	364	1,647	2,011	5,161
2002E	401	586	602	1,050	283	1,334	256	2,308	2,564	5,486
Forecast										
2003	394	544	543	963	312	1,275	246	2,898	3,143	5,899
2004	388	506	487	881	322	1,203	236	3,475	3,711	6,296
2005	382	468	458	800	323	1,123	227	3,927	4,155	6,586
2006	377	431	429	720	324	1,044	218	4,462	4,680	6,960
2007	371	405	414	666	324	990	213	4,964	5,177	7,358
2008	365	392	399	628	325	952	209	5,372	5,580	7,688
2009	359	390	397	612	325	937	208	5,726	5,934	8,017
2010	357	388	395	596	329	925	206	6,041	6,247	8,312
2011	356	388	395	596	332	928	214	6,336	6,550	8,616
2012	354	388	395	596	335	932	224	6,633	6,857	8,925
2013	352	388	395	596	339	935	233	6,934	7,167	9,237
2014	350	388	395	596	342	939	243	7,240	7,482	9,554

* Source: 1997-2001, AvStat Associates, Inc./Regional Airline Association.

TABLE 29

ACTIVE GENERAL AVIATION AND AIR TAXI AIRCRAFT

AS OF DECEMBER 31	FIXED WING				ROTORCRAFT		EXPERI-MENTAL	SPORT AIRCRAFT	OTHER	TOTAL
	PISTON		TURBINE							
	SINGLE ENGINE	MULTI-ENGINE	TURBOPROP	TURBO JET	PISTON	TURBINE				
Historical*										
1997 1/	140,038	16,017	5,619	5,178	2,259	4,526	14,680	NA	4,092	192,414
1998	144,234	18,729	6,174	6,066	2,545	4,881	16,502	NA	5,580	204,710
1999	150,886	21,038	5,679	7,120	2,564	4,884	20,528	NA	6,765	219,464
2000	149,422	21,091	5,762	7,001	2,680	4,470	20,407	NA	6,700	217,533
2001	145,034	18,281	6,596	7,787	2,292	4,491	20,421	NA	6,545	211,447
2002E	144,500	18,240	6,600	8,000	2,450	4,350	20,400	NA	6,500	211,040
Forecast										
2003	144,550	18,210	6,690	8,200	2,470	4,350	20,400	NA	6,500	211,370
2004	144,900	18,170	6,810	8,400	2,500	4,370	20,450	1,000	6,520	213,120
2005	145,400	18,140	6,940	8,700	2,530	4,390	20,550	2,300	6,540	215,490
2006	146,000	18,100	7,070	9,100	2,560	4,415	20,650	2,600	6,560	217,055
2007	146,600	18,060	7,200	9,500	2,590	4,440	20,750	3,100	6,580	218,820
2008	147,200	18,030	7,330	9,900	2,620	4,465	20,850	3,600	6,600	220,595
2009	147,600	17,990	7,450	10,300	2,650	4,490	20,950	4,100	6,620	222,150
2010	148,000	17,960	7,580	10,700	2,680	4,510	21,050	4,600	6,640	223,720
2011	148,400	17,920	7,700	11,100	2,710	4,530	21,150	5,000	6,660	225,170
2012	148,800	17,880	7,810	11,500	2,740	4,550	21,250	5,400	6,680	226,610
2013	149,200	17,850	7,920	11,900	2,770	4,570	21,350	5,800	6,700	228,060
2014	149,600	17,810	8,020	12,300	2,800	4,590	21,450	6,200	6,720	229,490

* Source: 1997-2001, FAA General Aviation and Air Taxi Activity (and Avionics) Surveys.
1/ Estimates have been revised to reflect changes in edit and estimation procedures, and may not be comparable to estimates prior to 1995.
Note: An active aircraft is one that has a current registration and was flown at least one hour during the calendar year.

TABLE 30

ACTIVE GENERAL AVIATION AND AIR TAXI HOURS FLOWN

(In Thousands)

CALENDAR YEAR	FIXED WING				ROTORCRAFT		EXPERI-MENTAL	SPORT AIRCRAFT	OTHER	TOTAL
	PISTON		TURBINE							
	SINGLE ENGINE	MULTI-ENGINE	TURBOPROP	TURBOJET	PISTON	TURBINE				
Historical*										
1997 1/	18,345	2,399	1,655	1,713	344	1,740	1,327	NA	192	27,715
1998	16,823	3,578	1,765	2,226	430	1,912	1,071	NA	295	28,100
1999	19,325	3,569	1,811	2,738	556	2,188	1,247	NA	318	31,752
2000	18,798	3,400	2,031	2,755	531	1,777	1,307	NA	374	30,973
2001	17,898	2,984	1,913	2,658	583	1,559	1,214	NA	324	29,133
2002E	17,920	2,980	2,010	2,890	490	1,620	1,200	NA	345	29,455
Forecast										
2003	18,000	2,980	2,110	3,035	500	1,625	1,200	NA	345	29,795
2004	18,110	2,975	2,130	3,185	510	1,640	1,210	90	350	30,200
2005	18,250	2,970	2,150	3,385	520	1,655	1,220	205	355	30,710
2006	18,400	2,970	2,170	3,625	530	1,675	1,230	235	360	31,195
2007	18,545	2,965	2,190	3,880	540	1,695	1,240	280	360	31,695
2008	18,695	2,965	2,210	4,145	550	1,715	1,250	325	365	32,220
2009	18,800	2,960	2,225	4,420	560	1,735	1,260	370	370	32,700
2010	18,915	2,955	2,240	4,710	570	1,755	1,270	415	375	33,205
2011	19,025	2,955	2,255	5,010	580	1,775	1,280	#REF!	380	#REF!
2012	19,135	2,950	2,270	5,315	590	1,795	1,290	485	385	34,215
2013	19,250	2,950	2,285	5,640	600	1,815	1,300	520	390	34,750
2014	19,360	2,945	2,300	5,975	610	1,835	1,310	560	395	35,290

* Source: 1997-2001, FAA General Aviation and Air Taxi Surveys.

1/ Estimates have been revised to reflect changes in edit and estimation procedures, and may not be comparable to estimates prior to 1995.

Note: An active aircraft is one that has a current registration and was flown at least one hour during the previous calendar year.

TABLE 31

ACTIVE PILOTS BY TYPE OF CERTIFICATE

AS OF DECEMBER 31	STUDENTS	RECREA-TIONAL	PRIVATE	COMMERCIAL	AIRLINE TRANSPORT	ROTORCRAFT ONLY	GLIDER ONLY	TOTAL PILOTS	TOTAL LESS AT PILOTS	INSTRUMENT RATED 1/
Historical*										
1997	96,101	284	247,604	125,300	130,858	6,801	9,394	616,342	485,484	297,409
1998	97,736	305	247,226	122,053	134,612	6,964	9,402	618,298	483,686	300,183
1999	99,184	343	258,749	124,261	137,642	7,728	9,390	637,297	499,655	308,951
2000	99,110	340	251,561	121,858	141,598	7,775	9,387	631,629	490,031	315,100
2001	94,420	318	261,927	137,636	146,989	7,727	8,473	657,490	510,501	321,000
2002E	85,991	318	260,845	137,504	147,104	7,770	21,826 2/	661,358	514,254	317,389
Forecast										
2003	86,850	320	262,150	138,200	147,850	7,600	21,830	664,800	516,950	319,610
2004	88,590	320	264,150	139,700	148,600	7,650	21,870	670,880	522,280	323,450
2005	91,700	325	266,150	141,700	150,600	7,700	21,920	680,095	529,495	329,270
2006	94,220	325	268,650	144,200	153,600	7,800	21,980	690,775	537,175	335,850
2007	96,130	330	271,650	146,900	157,100	7,900	22,050	702,060	544,960	342,570
2008	98,080	330	274,650	149,700	161,100	8,000	22,110	713,970	552,870	349,420
2009	100,070	335	277,450	152,200	165,100	8,100	22,160	725,415	560,315	356,060
2010	102,110	335	280,250	154,500	168,600	8,200	22,200	736,195	567,595	362,470
2011	104,180	335	282,950	156,600	172,100	8,300	22,250	746,715	574,615	368,630
2012	106,290	340	285,550	158,600	175,600	8,400	22,290	757,070	581,470	374,530
2013	108,450	340	288,050	160,600	179,100	8,500	22,340	767,380	588,280	380,150
2014	110,660	340	290,550	162,600	182,600	8,600	22,380	777,730	595,130	385,850

* Source: FAA U.S. Civil Airmen Statistics.

1/ Instrument rated pilots should not be added to other categories in deriving total.

2/ In March 2001, the FAA Registry changed the definition of this pilot category. It added approximately 13,000 to this pilot category.

E: Estimate

Note: An active pilot is a person with a pilot certificate and a valid medical certificate.

TABLE 32

GENERAL AVIATION AIRCRAFT FUEL CONSUMPTION

(In Millions of Gallons)

CALENDAR YEAR	FIXED WING				ROTORCRAFT		EXPERI-MENTAL/ SPORT/ OTHER	TOTAL FUEL CONSUMED		
	PISTON		TURBINE							
	SINGLE ENGINE	MULTI-ENGINE	TURBO-PROP	TURBO-JET	PISTON	TURBINE		AVGAS	JET FUEL	TOTAL
Historical										
1997	196.3	73.2	135.7	456.9	5.2	49.4	17.5	292.2	642.0	934.2
1998	181.8	109.6	149.1	608.8	6.5	56.8	13.4	311.3	814.7	1,126.0
1999	209.9	111.6	153.3	750.8	8.4	63.2	15.5	345.4	967.3	1,312.7
2000	208.7	108.3	180.5	766.4	8.0	51.2	11.8	336.8	998.1	1,334.9
2001E	194.6	100.8	163.6	729.5	8.8	45.6	14.9	319.1	938.7	1,257.8
2002	195.3	101.3	172.9	794.8	7.4	47.0	14.8	318.8	1,014.7	1,333.5
Forecast										
2003	198.0	101.9	181.5	834.6	7.6	47.3	14.8	322.3	1,063.4	1,385.7
2004	201.0	102.3	183.6	875.9	7.7	47.9	16.0	327.0	1,107.4	1,434.4
2005	204.4	102.8	185.8	927.5	7.9	48.5	17.5	332.6	1,161.8	1,494.4
2006	207.9	103.4	187.7	989.6	8.0	49.2	18.0	337.3	1,226.5	1,563.8
2007	211.4	103.8	189.7	1,055.4	8.2	49.8	18.7	342.1	1,294.9	1,637.0
2008	215.0	104.4	191.6	1,123.3	8.3	50.4	19.4	347.1	1,365.3	1,712.4
2009	218.1	104.8	193.1	1,193.4	8.5	51.0	20.0	351.4	1,437.5	1,788.9
2010	221.3	105.2	194.7	1,267.0	8.6	51.8	20.7	355.8	1,513.5	1,869.3
2011	224.5	105.8	196.2	1,342.7	8.8	52.4	21.3	360.4	1,591.3	1,951.7
2012	227.7	106.2	197.7	1,419.1	8.9	53.0	21.8	364.6	1,669.8	2,034.4
2013	231.0	106.8	199.3	1,500.2	9.1	53.5	22.4	369.3	1,753.0	2,122.3
2014	234.3	107.2	200.8	1,583.4	9.2	54.1	23.0	373.7	1,838.3	2,212.0

Source: FAA APO Estimates.
Note: Detail may not add to total because of independent rounding.

TABLE 33

ACTIVE ROTORCRAFT FLEET AND HOURS FLOWN

CALENDAR YEAR	ACTIVE FLEET			HOURS FLOWN (Thousands)		
	PISTON	TURBINE	TOTAL	PISTON	TURBINE	TOTAL
Historical*						
1997 1/	2,259	4,526	6,785	344	1,740	2,084
1998	2,545	4,881	7,426	430	1,912	2,342
1999	2,564	4,884	7,448	556	2,188	2,744
2000	2,680	4,470	7,150	531	1,777	2,308
2001	2,292	4,491	6,783	583	1,559	2,142
2002E	2,450	4,350	6,800	490	1,620	2,110
Forecast						
2003	2,470	4,350	6,820	500	1,625	2,125
2004	2,500	4,370	6,870	510	1,640	2,150
2005	2,530	4,390	6,920	520	1,655	2,175
2006	2,560	4,415	6,975	530	1,675	2,205
2007	2,590	4,440	7,030	540	1,695	2,235
2008	2,620	4,465	7,085	550	1,715	2,265
2009	2,650	4,490	7,140	560	1,735	2,295
2010	2,680	4,510	7,190	570	1,755	2,325
2011	2,710	4,530	7,240	580	1,775	2,355
2012	2,740	4,550	7,290	590	1,795	2,385
2013	2,770	4,570	7,340	600	1,815	2,415
2014	2,800	4,590	7,390	610	1,835	2,445

* Source: 1997-2001, FAA General Aviation and Air Taxi Activity (and Avionics) Surveys.
1/ Estimates have been revised to reflect changes in edit and estimation procedures, and may not be comparable to estimates prior to 1995.
Notes: An active aircraft is one that has a current registration and was flown at least one hour during the calendar year.

TABLE 34

TOTAL COMBINED AIRCRAFT OPERATIONS AT AIRPORTS

WITH FAA AND CONTRACT TRAFFIC CONTROL SERVICE

(In Thousands)

FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL	NUMBER OF TOWERS	
						FAA	CONTRACT
Historical*							
1997	14,256.7	10,052.7	36,833.3	2,523.6	63,666.3	289	160
1998	14,258.0	10,172.2	38,046.5	2,781.4	65,258.1	288	161
1999	14,581.2	10,573.5	39,999.6	2,950.5	68,104.8	288	165
2000	15,158.7	10,760.6	39,878.5	2,888.0	68,685.8	266	192
2001	14,760.9	10,881.7	37,620.0	2,917.1	66,179.7	266	206
2002E	13,208.6	11,029.5	37,575.4	3,062.2	64,875.7	266	217
Forecast							
2003	12,938.3	11,305.2	37,565.6	3,074.1	64,883.2	266	224
2004	13,361.2	11,757.5	38,336.3	3,085.4	66,540.4	266	224
2005	13,740.5	12,227.8	38,847.3	3,085.4	67,901.0	266	224
2006	14,065.7	12,619.4	39,396.4	3,085.4	69,166.9	266	224
2007	14,365.1	12,995.4	39,931.0	3,085.4	70,376.9	266	224
2008	14,686.4	13,341.3	40,472.9	3,085.4	71,586.0	266	224
2009	15,029.5	13,679.3	40,981.6	3,085.4	72,775.8	266	224
2010	15,396.8	14,010.9	41,497.0	3,085.4	73,990.1	266	224
2011	15,786.8	14,337.7	42,018.5	3,085.4	75,228.4	266	224
2012	16,200.1	14,659.2	42,546.8	3,085.4	76,491.5	266	224
2013	16,642.5	14,976.6	43,081.6	3,085.4	77,786.1	266	224
2014	17,135.5	15,290.1	43,623.1	3,085.4	79,134.1	266	224

* Source: FAA Air Traffic Activity.

TABLE 35

COMBINED ITINERANT AIRCRAFT OPERATIONS AT AIRPORTS WITH FAA AND CONTRACT TRAFFIC CONTROL SERVICE

(In Thousands)

FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL
Historical*					
1997	14,256.7	10,052.7	21,669.1	1,276.5	47,255.0
1998	14,258.0	10,172.2	22,086.5	1,354.4	47,871.1
1999	14,581.2	10,573.5	23,019.4	1,441.6	49,615.7
2000	15,158.7	10,760.6	22,844.1	1,439.8	50,203.2
2001E	14,760.9	10,881.7	21,432.0	1,479.5	48,554.1
2002	13,208.6	11,029.5	21,419.9	1,551.2	47,209.2
Forecast					
2003	12,938.3	11,305.2	21,354.4	1,562.9	47,160.8
2004	13,361.2	11,757.5	21,803.1	1,574.2	48,496.0
2005	13,740.5	12,227.8	22,122.8	1,574.2	49,665.3
2006	14,065.7	12,619.4	22,454.6	1,574.2	50,713.9
2007	14,365.1	12,995.4	22,769.0	1,574.2	51,703.7
2008	14,686.4	13,341.3	23,087.7	1,574.2	52,689.6
2009	15,029.5	13,679.3	23,387.8	1,574.2	53,670.8
2010	15,396.8	14,010.9	23,692.0	1,574.2	54,673.9
2011	15,786.8	14,337.7	23,999.9	1,574.2	55,698.6
2012	16,200.1	14,659.2	24,311.9	1,574.2	56,745.4
2013	16,642.5	14,976.6	24,628.0	1,574.2	57,821.3
2014	17,135.5	15,290.1	24,948.1	1,574.2	58,947.9

* Source: FAA Air Traffic Activity.

TABLE 36

COMBINED LOCAL AIRCRAFT OPERATIONS AT AIRPORTS WITH FAA AND CONTRACT TRAFFIC CONTROL SERVICE

(In Thousands)

FISCAL YEAR	GENERAL AVIATION	MILITARY	TOTAL
Historical*			
1997	15,164.2	1,247.1	16,411.3
1998	15,960.0	1,427.0	17,387.0
1999	16,980.2	1,508.9	18,489.1
2000	17,034.4	1,448.2	18,482.6
2001E	16,188.0	1,437.6	17,625.6
2002	16,155.5	1,511.0	17,666.5
Forecast			
2003	16,211.2	1,511.2	17,722.4
2004	16,533.2	1,511.2	18,044.4
2005	16,724.5	1,511.2	18,235.7
2006	16,941.8	1,511.2	18,453.0
2007	17,162.0	1,511.2	18,673.2
2008	17,385.2	1,511.2	18,896.4
2009	17,593.8	1,511.2	19,105.0
2010	17,805.0	1,511.2	19,316.2
2011	18,018.6	1,511.2	19,529.8
2012	18,234.9	1,511.2	19,746.1
2013	18,453.6	1,511.2	19,964.8
2014	18,675.0	1,511.2	20,186.2

* Source: FAA Air Traffic Activity.

TABLE 37

TOTAL AIRCRAFT OPERATIONS

AT AIRPORTS WITH FAA TRAFFIC CONTROL SERVICE

(In Thousands)

FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL
Historical*					
1997	14,112.0	8,968.8	28,232.5	1,942.9	53,256.2
1998	14,101.7	8,928.1	27,928.8	2,028.8	52,987.4
1999	14,422.7	9,316.5	29,110.1	2,181.7	55,031.0
2000	14,921.1	9,217.2	27,002.8	2,031.7	53,172.8
2001E	14,537.8	9,304.5	24,777.1	1,998.4	50,617.8
2002	13,003.5	9,469.4	24,064.1	2,012.4	48,549.4
Forecast					
2003	12,737.3	9,706.1	23,796.5	2,012.4	48,252.3
2004	13,153.6	10,094.4	24,053.3	2,012.4	49,313.7
2005	13,527.0	10,498.2	24,385.6	2,012.4	50,423.2
2006	13,847.2	10,834.1	24,732.0	2,012.4	51,425.7
2007	14,141.9	11,156.8	25,068.6	2,012.4	52,379.7
2008	14,458.2	11,453.8	25,409.7	2,012.4	53,334.1
2009	14,796.0	11,744.0	25,730.0	2,012.4	54,282.4
2010	15,157.6	12,028.7	26,054.5	2,012.4	55,253.2
2011	15,541.5	12,309.2	26,382.9	2,012.4	56,246.0
2012	15,948.4	12,585.3	26,715.6	2,012.4	57,261.7
2013	16,383.9	12,857.8	27,052.3	2,012.4	58,306.4
2014	16,869.2	13,126.9	27,393.4	2,012.4	59,401.9

* Source: FAA Air Traffic Activity.

TABLE 38

ITINERANT AIRCRAFT OPERATIONS

AT AIRPORTS WITH FAA TRAFFIC CONTROL SERVICE

(In Thousands)

FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL
Historical*					
1997	14,112.0	8,968.8	17,097.3	1,015.4	41,193.5
1998	14,101.7	8,928.1	16,846.1	1,052.3	40,928.2
1999	14,422.7	9,316.5	17,422.2	1,118.6	42,280.0
2000	14,921.1	9,217.2	16,286.1	1,090.6	41,515.0
2001	14,537.8	9,304.5	14,948.2	1,090.3	39,880.8
2002E	13,003.5	9,469.4	14,542.7	1,100.8	38,116.4
Forecast					
2003	12,737.3	9,706.1	14,374.6	1,100.8	37,918.8
2004	13,153.6	10,094.4	14,561.4	1,100.8	38,910.2
2005	13,527.0	10,498.2	14,779.8	1,100.8	39,905.8
2006	13,847.2	10,834.1	15,001.4	1,100.8	40,783.5
2007	14,141.9	11,156.8	15,211.5	1,100.8	41,611.0
2008	14,458.2	11,453.8	15,424.4	1,100.8	42,437.2
2009	14,796.0	11,744.0	15,624.9	1,100.8	43,265.7
2010	15,157.6	12,028.7	15,828.1	1,100.8	44,115.2
2011	15,541.5	12,309.2	16,033.8	1,100.8	44,985.3
2012	15,948.4	12,585.3	16,242.3	1,100.8	45,876.8
2013	16,383.9	12,857.8	16,453.4	1,100.8	46,795.9
2014	16,869.2	13,126.9	16,667.3	1,100.8	47,764.2

* Source: FAA Air Traffic Activity.

TABLE 39

LOCAL AIRCRAFT OPERATIONS

AT AIRPORTS WITH FAA TRAFFIC CONTROL SERVICE

(In Thousands)

FISCAL YEAR	GENERAL AVIATION	MILITARY	TOTAL
Historical*			
1997	11,135.2	927.5	12,062.7
1998	11,082.7	976.5	12,059.2
1999	11,687.9	1,063.1	12,751.0
2000	10,716.7	941.1	11,657.8
2001	9,828.9	908.1	10,737.0
2002E	9,521.4	911.6	10,433.0
Forecast			
2003	9,421.9	911.6	10,333.5
2004	9,491.9	911.6	10,403.5
2005	9,605.8	911.6	10,517.4
2006	9,730.6	911.6	10,642.2
2007	9,857.1	911.6	10,768.7
2008	9,985.3	911.6	10,896.9
2009	10,105.1	911.6	11,016.7
2010	10,226.4	911.6	11,138.0
2011	10,349.1	911.6	11,260.7
2012	10,473.3	911.6	11,384.9
2013	10,598.9	911.6	11,510.5
2014	10,726.1	911.6	11,637.7

* Source: FAA Air Traffic Activity.

TABLE 40

TOTAL AIRCRAFT OPERATIONS

AT AIRPORTS WITH CONTRACT TRAFFIC CONTROL SERVICE

(In Thousands)

FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL
Historical*					
1997	144.7	1,083.9	8,600.8	580.7	10,410.1
1998	156.3	1,244.1	10,117.7	752.6	12,270.7
1999	158.5	1,257.0	10,889.5	768.8	13,073.8
2000	237.6	1,543.4	12,875.7	856.3	15,513.0
2001	223.1	1,577.2	12,842.9	918.7	15,561.9
2002E	205.1	1,560.1	13,511.3	1,049.8	16,326.3
Forecast					
2003	201.0	1,599.1	13,769.1	1,061.7	16,630.8
2004	207.6	1,663.1	14,282.9	1,073.0	17,226.7
2005	213.5	1,729.6	14,461.7	1,073.0	17,477.8
2006	218.6	1,785.3	14,664.4	1,073.0	17,741.2
2007	223.2	1,838.6	14,862.5	1,073.0	17,997.3
2008	228.2	1,887.5	15,063.2	1,073.0	18,251.9
2009	233.5	1,935.3	15,251.6	1,073.0	18,493.4
2010	239.2	1,982.2	15,442.5	1,073.0	18,736.9
2011	245.3	2,028.5	15,635.6	1,073.0	18,982.4
2012	251.7	2,073.9	15,831.2	1,073.0	19,229.8
2013	258.6	2,118.8	16,029.3	1,073.0	19,479.7
2014	266.2	2,163.2	16,229.7	1,073.0	19,732.2

* Source: FAA Air Traffic Activity.
Note: Detail may not add to total because of rounding.

TABLE 41

ITINERANT AIRCRAFT OPERATIONS

AT AIRPORTS WITH CONTRACT TRAFFIC CONTROL SERVICE

(In Thousands)

FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL
Historical*					
1997	144.7	1,083.9	4,571.8	261.1	6,061.5
1998	156.3	1,244.1	5,240.4	302.1	6,942.9
1999	158.5	1,257.0	5,597.2	323.0	7,335.7
2000	237.6	1,543.4	6,558.0	349.2	8,688.2
2001	223.1	1,577.2	6,483.8	389.2	8,673.3
2002E	205.1	1,560.1	6,877.2	450.4	9,092.8
Forecast					
2003	201.0	1,599.1	6,979.8	462.1	9,241.9
2004	207.6	1,663.1	7,241.7	473.4	9,585.8
2005	213.5	1,729.6	7,343.0	473.4	9,759.5
2006	218.6	1,785.3	7,453.2	473.4	9,930.4
2007	223.2	1,838.6	7,557.5	473.4	10,092.7
2008	228.2	1,887.5	7,663.3	473.4	10,252.4
2009	233.5	1,935.3	7,762.9	473.4	10,405.2
2010	239.2	1,982.2	7,863.9	473.4	10,558.7
2011	245.3	2,028.5	7,966.1	473.4	10,713.3
2012	251.7	2,073.9	8,069.6	473.4	10,868.6
2013	258.6	2,118.8	8,174.6	473.4	11,025.4
2014	266.2	2,163.2	8,280.8	473.4	11,183.7

* Source: FAA Air Traffic Activity.

TABLE 42

LOCAL AIRCRAFT OPERATIONS

AT AIRPORTS WITH CONTRACT TRAFFIC CONTROL SERVICE

(In Thousands)

FISCAL YEAR	GENERAL AVIATION	MILITARY	TOTAL
Historical*			
1997	4,029.0	319.6	4,348.6
1998	4,877.3	450.5	5,327.8
1999	5,292.3	445.8	5,738.1
2000	6,317.7	507.1	6,824.8
2001	6,359.1	529.5	6,888.6
2002E	6,634.1	599.4	7,233.5
Forecast			
2003	6,789.3	599.6	7,388.9
2004	7,041.3	599.6	7,640.9
2005	7,118.7	599.6	7,718.3
2006	7,211.2	599.6	7,810.8
2007	7,304.9	599.6	7,904.5
2008	7,399.9	599.6	7,999.5
2009	7,488.7	599.6	8,088.3
2010	7,578.6	599.6	8,178.2
2011	7,669.5	599.6	8,269.1
2012	7,761.6	599.6	8,361.2
2013	7,854.7	599.6	8,454.3
2014	7,948.9	599.6	8,548.5

* Source: FAA Air Traffic Activity.

TABLE 43

TOTAL COMBINED INSTRUMENT OPERATIONS

AT AIRPORTS WITH FAA AND CONTRACT TRAFFIC CONTROL SERVICE

(In Thousands)

FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL
Historical*					
1997	15,388.1	11,020.9	19,087.9	3,282.0	48,778.9
1998	15,405.1	11,220.6	19,931.2	3,423.7	49,980.6
1999	15,833.1	11,586.7	20,897.8	3,512.3	51,829.9
2000	16,534.8	11,626.4	21,223.2	3,529.9	52,914.3
2001	15,973.4	11,734.9	19,700.0	3,524.3	50,932.6
2002E	14,374.8	11,938.4	19,656.4	3,586.0	49,555.6
Forecast					
2003	14,082.5	12,236.9	19,443.7	3,586.0	49,349.0
2004	14,542.7	12,726.3	19,783.7	3,586.0	50,638.7
2005	14,955.6	13,235.4	20,119.8	3,586.0	51,896.7
2006	15,309.6	13,658.9	20,441.3	3,586.0	52,995.8
2007	15,635.4	14,068.6	20,768.1	3,586.0	54,058.1
2008	15,985.1	14,443.1	21,120.6	3,586.0	55,134.8
2009	16,358.5	14,808.9	21,437.1	3,586.0	56,190.5
2010	16,758.3	15,168.1	21,758.4	3,586.0	57,270.8
2011	17,182.8	15,521.7	22,084.4	3,586.0	58,374.9
2012	17,632.7	15,869.8	22,415.4	3,586.0	59,503.9
2013	18,114.2	16,213.5	22,751.3	3,586.0	60,665.0
2014	18,650.8	16,552.9	23,092.3	3,586.0	61,882.0

* Source: FAA Air Traffic Activity.

TABLE 44

INSTRUMENT OPERATIONS

AT AIRPORTS WITH FAA TRAFFIC CONTROL SERVICE

(In Thousands)

FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL
Historical*					
1997	15,298.0	10,730.9	18,863.7	3,235.6	48,128.2
1998	15,309.9	10,916.3	19,678.6	3,368.0	49,272.8
1999	15,742.3	11,270.0	20,643.7	3,454.2	51,110.2
2000	16,408.8	11,245.5	20,945.7	3,468.7	52,068.7
2001	15,851.0	11,354.8	19,426.3	3,461.3	50,093.4
2002E	14,253.5	11,582.2	19,381.0	3,525.0	48,741.7
Forecast					
2003	13,963.7	11,871.8	19,171.8	3,525.0	48,532.3
2004	14,420.0	12,346.6	19,507.1	3,525.0	49,798.8
2005	14,829.4	12,840.5	19,838.8	3,525.0	51,033.7
2006	15,180.4	13,251.4	20,156.1	3,525.0	52,112.9
2007	15,503.5	13,648.9	20,478.6	3,525.0	53,156.0
2008	15,850.3	14,012.3	20,826.8	3,525.0	54,214.4
2009	16,220.5	14,367.2	21,139.2	3,525.0	55,251.9
2010	16,617.0	14,715.6	21,456.3	3,525.0	56,313.9
2011	17,037.9	15,058.6	21,778.1	3,525.0	57,399.6
2012	17,483.9	15,396.4	22,104.8	3,525.0	58,510.1
2013	17,961.4	15,729.8	22,436.3	3,525.0	59,652.5
2014	18,493.4	16,059.1	22,772.9	3,525.0	60,850.4

* Source: FAA Air Traffic Activity.

TABLE 45

INSTRUMENT OPERATIONS

AT AIRPORTS WITH CONTRACT TRAFFIC CONTROL SERVICE

(In Thousands)

FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL
Historical*					
1997	90.1	290.0	224.2	46.4	650.7
1998	95.2	304.3	252.6	55.7	707.8
1999	90.8	316.7	254.1	58.1	719.7
2000	126.0	380.9	277.5	61.2	845.6
2001	122.4	380.1	273.7	63.0	839.2
2002E	121.3	356.2	275.4	61.0	813.9
Forecast					
2003	118.8	365.1	271.8	61.0	816.7
2004	122.7	379.7	276.6	61.0	840.0
2005	126.2	394.9	281.0	61.0	863.1
2006	129.2	407.5	285.2	61.0	882.9
2007	131.9	419.7	289.5	61.0	902.1
2008	134.8	430.8	293.8	61.0	920.4
2009	138.0	441.7	297.9	61.0	938.6
2010	141.4	452.5	302.1	61.0	957.0
2011	145.0	463.1	306.3	61.0	975.4
2012	148.7	473.4	310.6	61.0	993.7
2013	152.8	483.7	315.0	61.0	1,012.5
2014	157.3	493.8	319.4	61.0	1,031.5

* Source: FAA Air Traffic Activity.

TABLE 46

IFR AIRCRAFT HANDLED

AT FAA AIR ROUTE TRAFFIC CONTROL CENTERS

(In Thousands)

FISCAL YEAR	IFR AIRCRAFT HANDLED				
	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL
Historical*					
1997	22,514.7	6,826.7	8,175.0	3,895.4	41,411.8
1998	23,227.0	7,137.1	8,641.1	4,190.7	43,195.9
1999	24,044.8	7,732.1	8,807.7	4,069.7	44,654.3
2000	24,987.1	8,100.9	8,744.4	4,192.5	46,024.9
2001	24,865.5	8,303.3	8,024.6	4,038.6	45,232.0
2002E	22,820.6	8,810.6	8,180.7	3,922.5	43,734.4
Forecast					
2003	22,352.2	9,049.3	8,261.8	3,922.5	43,585.8
2004	23,082.7	9,423.8	8,406.2	3,922.5	44,835.2
2005	23,738.0	9,814.4	8,548.9	3,922.5	46,023.8
2006	24,299.9	10,130.7	8,694.4	3,922.5	47,047.5
2007	24,817.0	10,432.3	8,842.0	3,922.5	48,013.8
2008	25,372.1	10,710.3	8,983.6	3,922.5	48,988.5
2009	25,964.8	10,981.6	9,127.2	3,922.5	49,996.1
2010	26,599.4	11,247.8	9,273.4	3,922.5	51,043.1
2011	27,273.1	11,509.9	9,412.3	3,922.5	52,117.8
2012	27,987.2	11,768.1	9,553.4	3,922.5	53,231.2
2013	28,751.5	12,023.0	9,696.5	3,922.5	54,393.5
2014	29,603.1	12,274.6	9,841.7	3,922.5	55,641.9

* Source: FAA Air Traffic Activity.

Note: Detail may not add to total because of rounding.

TABLE 47

IFR DEPARTURES AND OVERS

AT FAA AIR ROUTE TRAFFIC CONTROL CENTERS

(In Thousands)

FISCAL YEAR	AIR CARRIER		AIR TAXI/COMMUTER		GENERAL AVIATION		MILITARY		TOTAL	
	IFR DEPARTURES	OVERS	IFR DEPARTURES	OVERS	IFR DEPARTURES	OVERS	IFR DEPARTURES	OVERS	IFR DEPARTURES	OVERS
Historical*										
1997	7,301.6	7,911.5	3,127.3	572.1	3,286.5	1,602.0	1,309.9	1,275.6	15,025.3	11,361.2
1998	7,677.1	7,872.8	3,284.7	567.7	3,493.6	1,653.9	1,485.2	1,220.3	15,940.6	11,314.7
1999	7,835.5	8,373.8	3,512.7	706.7	3,535.2	1,737.3	1,467.3	1,135.1	16,350.7	11,952.9
2000	8,036.2	8,914.7	3,641.4	818.1	3,476.3	1,791.8	1,482.7	1,227.1	16,636.6	12,751.7
2001	7,828.1	9,209.3	3,633.5	1,036.3	3,191.9	1,640.8	1,428.1	1,182.4	16,081.6	13,068.8
2002E	7,127.7	8,565.2	3,792.1	1,226.4	3,240.4	1,699.9	1,372.9	1,176.7	15,533.1	12,668.2
Forecast										
2003	6,981.5	8,389.2	3,886.9	1,275.5	3,272.4	1,717.0	1,372.9	1,176.7	15,513.7	12,558.4
2004	7,209.7	8,663.3	4,042.3	1,339.2	3,329.6	1,747.0	1,372.9	1,176.7	15,954.5	12,926.2
2005	7,414.3	8,909.3	4,204.1	1,406.2	3,386.1	1,776.7	1,372.9	1,176.7	16,377.4	13,268.9
2006	7,589.8	9,120.2	4,339.6	1,451.5	3,443.8	1,806.9	1,372.9	1,176.7	16,746.1	13,555.3
2007	7,751.3	9,314.3	4,468.8	1,494.7	3,502.2	1,837.6	1,372.9	1,176.7	17,095.2	13,823.3
2008	7,924.7	9,522.6	4,587.9	1,534.5	3,558.3	1,867.0	1,372.9	1,176.7	17,443.8	14,100.8
2009	8,109.9	9,745.1	4,704.1	1,573.4	3,615.2	1,896.8	1,372.9	1,176.7	17,802.1	14,392.0
2010	8,308.1	9,983.2	4,818.1	1,611.6	3,673.1	1,927.2	1,372.9	1,176.7	18,172.2	14,698.7
2011	8,518.5	10,236.1	4,930.4	1,649.1	3,728.1	1,956.1	1,372.9	1,176.7	18,549.9	15,018.0
2012	8,741.5	10,504.1	5,041.0	1,686.1	3,784.0	1,985.4	1,372.9	1,176.7	18,939.4	15,352.3
2013	8,980.3	10,791.0	5,150.2	1,722.6	3,840.7	2,015.1	1,372.9	1,176.7	19,344.1	15,705.4
2014	9,246.3	11,110.6	5,258.0	1,758.6	3,898.2	2,045.3	1,372.9	1,176.7	19,775.4	16,091.2

* Source: FAA Air Traffic Activity.

Note: Totals may not add because of rounding.

TABLE 48

TOTAL FLIGHT SERVICES

AT FAA FLIGHT SERVICE STATIONS

(In Thousands)

FISCAL YEAR	FLIGHT PLANS ORIGINATED	PILOT BRIEFS	AIRCRAFT CONTACTED	TOTAL FLIGHT SERVICES	FLIGHT SERVICES INCLUDING DUATS
Historical*					
1997	6,725	8,724	3,704	34,602	48,010
1998	6,493	8,727	3,476	33,916	46,774
1999	6,252	8,293	3,325	32,415	45,785
2000	5,925	7,713	3,205	30,481	45,483
2001	5,749	7,424	2,964	29,310	45,228
2002E	5,772	7,458	2,974	29,434	45,900
Forecast					
2003	5,631	7,323	2,984	28,892	45,258
2004	5,605	7,308	2,966	28,793	45,592
2005	5,580	7,294	2,944	28,691	45,490
2006	5,599	7,279	2,930	28,686	46,092
2007	5,619	7,265	2,909	28,675	46,350
2008	5,638	7,250	2,889	28,666	46,340
2009	5,658	7,236	2,866	28,653	46,872
2010	5,678	7,221	2,839	28,637	47,131
2011	5,698	7,207	2,811	28,620	47,115
2012	5,719	7,192	2,782	28,605	47,661
2013	5,741	7,178	2,748	28,585	47,641
2014	5,762	7,163	2,712	28,563	48,195

* Source: FAA Air Traffic Activity.

Notes: Total flight services is equal to the sum of flight plans originated and pilot briefs, multiplied by two, plus the number of aircraft contacted.

TABLE 49

FLIGHT PLANS ORIGINATED

AT FAA FLIGHT SERVICE STATIONS

(In Thousands)

FISCAL YEAR	FLIGHT PLANS ORIGINATED		
	IFR-DVFR	VFR	TOTAL
Historical*			
1997	5,367	1,358	6,725
1998	5,227	1,266	6,493
1999	5,018	1,234	6,252
2000	4,668	1,257	5,925
2001	4,516	1,233	5,749
2002E	4,541	1,231	5,772
Forecast			
2003	4,413	1,218	5,631
2004	4,391	1,214	5,605
2005	4,369	1,211	5,580
2006	4,391	1,208	5,599
2007	4,413	1,206	5,619
2008	4,435	1,203	5,638
2009	4,457	1,201	5,658
2010	4,479	1,199	5,678
2011	4,502	1,196	5,698
2012	4,524	1,195	5,719
2013	4,547	1,194	5,741
2014	4,570	1,193	5,762

* Source: FAA Air Traffic Activity.
Notes: Detail may not add to total because of rounding.

TABLE 50

AIRCRAFT CONTACTED

AT FAA FLIGHT SERVICE STATIONS

(In Thousands)

FISCAL YEAR	USER CATEGORY				FLIGHT RULES		
	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	IFR-DVFR	VFR	TOTAL
Historical*							
1997	138	588	2,804	174	1,133	2,572	3,704
1998	150	570	2,600	156	1,138	2,338	3,476
1999	136	515	2,524	150	1,044	2,282	3,325
2000	127	495	2,438	145	960	2,245	3,205
2001	108	514	2,196	146	922	2,042	2,964
2002E	96	558	2,170	150	868	2,105	2,974
Forecast							
2003	95	561	2,177	150	866	2,120	2,984
2004	95	561	2,162	148	857	2,109	2,966
2005	94	559	2,145	146	848	2,096	2,944
2006	93	556	2,135	146	841	2,089	2,930
2007	90	547	2,129	143	832	2,077	2,909
2008	89	537	2,122	141	823	2,066	2,889
2009	89	527	2,110	140	813	2,053	2,866
2010	88	516	2,097	138	803	2,036	2,839
2011	86	506	2,081	138	792	2,019	2,811
2012	85	495	2,064	138	781	2,001	2,782
2013	82	483	2,047	136	769	1,979	2,748
2014	81	473	2,023	135	757	1,955	2,712

* Source: FAA Air Traffic Activity.
Notes: Detail may not add to total because of rounding.

TABLE 51

AUTOMATED FLIGHT SERVICES

DUATS TRANSACTIONS

(In Thousands)

FISCAL YEAR	DUATS FLIGHT PLANS	DUATS TRANSACTIONS	TOTAL DUATS
Historical*			
1996	911	5,119	12,060
1997	857	5,847	13,408
1998	881	5,548	12,858
1999	724	5,961	13,370
2000	799	6,702	15,002
2001	787	7,172	15,918
2002E	1,168	7,065	16,466
Forecast			
2003	1,143	7,040	16,366
2004	1,169	7,230	16,799
2005	1,194	7,375	17,137
2006	1,218	7,485	17,406
2007	1,240	7,598	17,674
2008	1,261	7,712	17,945
2009	1,282	7,827	18,219
2010	1,303	7,945	18,495
2011	1,324	8,064	18,775
2012	1,343	8,185	19,056
2013	1,364	8,308	19,342
2014	1,384	8,432	19,632

* Source: FAA Air Traffic Activity. DUATS began in 1990.

Notes: Total DUATS services are equal to the sum of flight plans originated and transactions multiplied by two.

APPENDIX A

FAA DOMESTIC FORECAST MODEL

This appendix presents an overview of the methodology and model used by the FAA to forecast U.S. large carrier domestic revenue passenger miles (RPMs), domestic passenger enplanements, and domestic yield and revenues. The FAA uses the forecasts of RPMs and enplanements to provide the basis for forecasts of aviation activity which are in turn, used to determine staffing levels and capital expenditures required to accommodate the growth of aviation activity while maintaining a safe, secure, and efficient environment.

Aviation forecasters have known for years that demand for aviation services, typically measured by Revenue Passenger Miles, or RPMs (one revenue passenger flying one mile) or enplanements, is influenced by a number of factors. In particular, demand is positively related to income in that as income increases, a greater amount of income will be devoted to air travel. Demand is negatively related to price, typically measured by yield – passenger revenue divided by RPMs, in that as the price of flying rises, all other things being equal, the number of people flying will decrease. Demand is also negatively related to the unemployment rate. If the unemployment rate rises given a constant labor force, the pool of potential travelers shrinks. In addition, a higher unemployment rate may lead to increased fiscal conservatism on the part of those who remain employed, leading to reduced air travel. Additional structural changes to the industry such as the introduction of jet aircraft in the late 1950's or deregulation of fares and routes (October 1978) have over time altered the relationships between demand and income and price. In addition, some unique events (such as when U.S. carriers engaged in destructive fare wars in 1986 and 1992 or the events of September 11th, 2001) have temporarily altered the relationship between demand and the economic variables mentioned above.

OVERVIEW OF MODEL

In general, the model used for developing the FAA domestic large air carrier forecast of traffic and yield relies upon a system of statistical and deterministic equations. The pivotal equations of the system relate RPMs, ASMs, and enplanements to three primary variables—Real U.S. Gross Domestic Product (GDP), Real U.S. Personal Consumption Expenditures (PCE), and real yield (incorporating taxes and fees). This analytical framework ties the domestic forecast model closer to projected changes in economic activity and reduces the number of subjective

inputs. The general functional form of the equation systems is as follows:

RPMs = f (PCE, Yield)
Yield = f (RPMs, Sept 11)
Enplanements = f (GDP or PCE, Yield, Sept 11)
ASMs = f (GDP or PCE)

In the equation systems there are a number of exogenous shift variables. The majority of these dummy variables are temporary in nature, attempting to account for short run disruptions to the long run relationships. One of these variables accounts for the impact to yields of Continental's low fare pricing experiment in East Coast markets during the 1994-1995 period, while another accounts for the impact to yields of the destructive fare war of 1992. Dummy variables are also used to account for the structural changes resulting from Southwest's expansion into East Coast markets and the introduction of the passenger segment fee.

Description of Data

The data for RPMs, ASMs, enplanements, and revenues is compiled and published by the U.S. Department of Transportation Bureau of Transportation Statistics (BTS). It is available in the P (financial) and T (traffic) schedules of the Form 41 database. The RPM, ASM, and enplanement data is compiled and published monthly while the revenue data are published on a quarterly basis. The revenue data that was used does not include the revenue for all-cargo carriers such as Federal Express, UPS, etc. GDP and Personal Consumption Expenditure (PCE) data is from the Bureau of Economic Analysis (BEA) while annual values for the U.S. unemployment rate were compiled from the Bureau of Labor Statistics. Tax revenue from the passenger ticket tax and the passenger segment fee was published by the Treasury Department while estimated revenues from Passenger Facility Charges (PFC's) were from the FAA. Historic values of real yield were computed by dividing passenger yield by the Consumer Price Index (CPI-U).

Methodology

The FAA's forecasting process is a continuous and interactive one that involves the FAA Statistics and Forecast Branch, as well as other FAA offices, government agencies, and aviation industry groups. The forecast process has been referred to as "decision-theoretic" in nature. The approach is generally accomplished in two stages. Initially, projections are made with the use of the econometric models described later in the paper. The model results are then adjusted based upon "expert industry opinion" to arrive at the posterior forecasts used in the decision-making process. The industry is segmented into two classes: Network Majors[1], and Low Cost/Low Fare[2] carriers. The rationale for this segmentation is that the response of travelers to changes in independent variables will be different in the two classes. For example, one would expect that the Low Fare/Low Cost carriers would have a higher price elasticity than the Network Majors whose passenger mix is typically more business oriented and less price sensitive. The Network Majors are those carriers who operate for the most part a traditional "hub and spoke" network. The Low Cost/Low Fare carriers are a select set of carriers who are or have been most recognized for their low fares. Each of these classes of carriers has their own system of equations that are used to project traffic and revenue. The domestic large air carrier forecast of traffic and

[1] DOT defines major carriers as those with annual revenues in excess of $1 billion. The passenger carriers making up this class are Alaska, America West, American, Continental, Delta, Northwest, TWA, United, US Airways and others (most notably Eastern and Pan Am (old))

[2] The low cost/low fare carriers are Southwest, Jet Blue, AirTran, Frontier, Vanguard, Spirit, Pro Air, Valujet, Morris Air, Kiwi, Carnival, TranStar, National, New York Air, Legend, Pan Am (new), People Express, Sun Country, American Trans Air, Western Pacific, Eastwind, and Air South.

revenue is simply the sum of the results of the forecasts for the two classes of carriers.

The model specification is as follows:

$NRPM_t = f(PCE_t, NRYLDT_t, URATE_t, Sept11)$
$NRYLD_t = f(NRPM_t, SUMSALE, Sept11, CALITE, NYLDGAP_{t-1}, NRYLD_{t-1})$
$NREVPT_t = f(NREVP_t, SEGFEE, TTRATE, RMAXFEE)$
$NENP_t = f(GDP_t, NREVPT_t, URATE_t, Sept11)$
$NASM_t = f(GDP_t, Sept11, WNEAST, STRIKE)$

$LCRPM_t = f(PCE_t, LCRYLDT_t, WNEAST)$
$LCRYLD_t = f(LCRPM_t, CALITE, Sept11)$
$LCRYLDT_t = f(LCRYLD_t, SEGFEE, TTRATE)$
$LCENP_t = f(GDP_t, WNEAST)$
$LCASM_t = f(PCE_t, WNEAST)$

Where

NRPM = Network Carrier RPMs
NRYLDT = Network Carrier Real Yield (w/ tax)
NENP = Network Carrier Enplanements
NASM = Network Carrier ASMs
NRYLD = Network Carrier Real Yield (w/o tax)
GDP = U.S. Real GDP (1996$ in Billions)
PCE = U.S. Real Personal Consumption Expenditures (1996$ in Billions)
URATE = U.S. Unemployment Rate
Sept11 = Variable ranging between 0 and 1 reflecting percent of full impact of Sept 11 events in future time periods
SUMSALE = Dummy variable, (1 in 1992, 0 otherwise)
SEGFEE = Dummy variable, (0 prior to 1998, 1 in 1998 and thereafter)
TTRATE = Value of passenger ticket tax rate
NYLDGAP = Ratio of Network Carrier Yield to Low Cost/Low Fare Carrier Yield
RMAXFEE = Maximum amount of fees and taxes added to base ticket price in constant $
NREVPT = Network Carrier Real Revenue Per Passenger (w/ tax)
STRIKE = Dummy variable, (1 in 1989, 1993, 1994, 1998), 0 otherwise
LCRPM = Low Cost/Low Fare Carrier RPMs
LCENP = Low Cost/Low Fare Carrier Enplanements
LCRYLDT = Low Cost/Low Fare Carrier Real Yield (w/ tax)
WNEAST = Dummy variable, (0 prior to 1994, 1 in 1994 and thereafter)
LCASM = Low Cost/Low Fare Carrier ASMs
LCRYLD = Low Cost/Low Fare Carrier Real Yield (w/o tax)
CALITE = Dummy variable, (1 in 1994 and 1995), 0 otherwise

The network carrier real yield (w/ tax) is calculated by taking the network carrier real revenue per passenger (w/ tax) divided by the network carrier passenger trip length. The network carrier passenger trip length is calculated by dividing the network carrier RPMs by the network carrier enplanements.

Model Results

Due to the simultaneous aspect of the model and in order to account for the contemporaneous correlation of error terms across the equation systems for the network major and low cost/low fare carriers, a three-stage least squares estimating procedure is employed. The estimation period for the model is from 1988 – 2002. All of the coefficients in the equations estimated had the expected sign and were significantly different from zero at the 95 percent confidence level with the exception of the RMAXFEE variable in the network carrier revenue per passenger equation and the NYLDGAP variable in the network real yield equation. The adjusted R-square values in all of the equations exceeded .925 indicating that more than 92.5 percent of the variance in the any of the dependent variables can be explained by the right hand side variables in the equations.